## SEARCH REQUEST FORM

## Scientific and Technical Information Center

Requester's Full Name:		Examiner # :	Date
All Unit: Phone N	Jumber 20	Serial Number:	Date;
Mail Box and Bldg/Room Location	l:	Results Format Preferred (circle	e): PAPER DISK E-MAI
If more than one search is subm	itted, please	prioritize searches in order of	need.
Please provide a detailed statement of the s Include the elected species or structures, k utility of the invention. Define any terms known. Please attach a copy of the cover s	search topic, and eywords, synony	describe as specifically as possible the sims, acronyms, and registry numbers, and	**************************************
Title of Invention:			
Inventors (please provide full names):			
Earliest Priority Filing Date:			
*For Sequence Searches Only * Please include	a all navious is a		
*For Sequence Searches Only* Please include appropriate serial number.	e un perun <b>e</b> nt injo	rmation (parent, child, divisional, or issued	patent numbers) along with the
			•
•			**************************************
		•	
/			
		•	
			•
*****		·	
TAFF USE ONLY	Type of Search	*******	*****
Vi a anna	NA Sequence (#)	Vendors and cost wh	
25541/6/	AA Sequence (#)		
ertion to marks in	Structure (#)		
te Searcher Distract I '	Bibliographic	Questel:Orbit	_
- Completed		Dr.Link	
rcher Pren & Danner T	Fulltext	Lexis/Nexis	
neal Pres Time		Sequence Systems	
Ine Time	Patent Family  Other	www/Internet	
	, mer	Other (specify)	

·			
٠			
	,		4
			•

```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Run
                                                                                                                                                                                                                                                                                                                                               Database
                                                                                                                                                                                                                                                                                                                                                                             Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                     Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OM nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                                     Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          on:
                                                                                                                                                                                                                                                                                                                                                                                             DB
BG
                                                                                                                                                                                                                                                                                                                                                                                           seq
seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                             | length:
| length:
   hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-502-426-1
6888
1 atgtgggtattata
                                                                                                                                                                                                                                                                                                                                                             Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                              EST:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      September 29, 2001, 06:50:11; Search time 4812.74 Seconds (without alignments) 13528.937 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                IDENTITY_NUC Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                   10228115 seqs, 4726426750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         atgtgggtattatattgttg.....cctagttcaggccaaagctt 6888
                                                                                                                                                                                                                                                gb_est9:*
gb_est10:*
gb_est11:*
gb_est12:*
                                                                                                                                                                                                                                                                                                                       gb_est1:*
gb_est2:*
gb_est3:*
 gb_est20:*
gb_est21:*
gb_est21:*
gb_est24:*
gb_est33:*
gb_est34:*
gb_est35:*
gb_est36:*
gb_est36:*
gb_est36:*
gb_est36:*
gb_est38:*
gb_est30:*
em_estbum1:*
em_estbum1:*
em_estbum3:*
em_estbum3:*
em_estbum6:*
em_estbum6:*
em_estbum6:*
em_estbum6:*
em_estbum6:*
em_estbum6:*
                                                                                                                                                                                                                                                                                        gb_est6:*
gb_est7:*
                                                                                                                                                                                         gb_est13:*
gb_est14:*
gb_est15:*
gb_est16:*
gb_est17:*
gb_est19:*
                                                                                                                                                                                                                                                                                  gb_est8:
                                                                                                                                                                                                                                                                                                        b_est5:*
                                                                                                                                                                                                                                                                                                                 _est4:*
                                                                                                                                                                                                                                                                                                                                                                                             2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                    residues
                                                                                                                                                                                                                                                                                                                                                                                                                    20456230
                                                                                      78:
79:
80:
80:
81:
82:
82:
83:
83:
83:
84:
84:
86:
86:
86:
87:
887:
90:
90:
90:
90:
90:
100:
100:
                                                                                                                                                                                                                                                                                                                                              106
                                                                                                                                                                                                                                                                                                                                                                                                                                         em_esthum23:*
em_esthum24:*
em_esthum25:*
em_esthum26:*
em_esthum27:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                em_esthum10:*
em_esthum11:*
em_esthum13:*
em_esthum13:*
em_esthum16:*
em_esthum16:*
em_esthum17:*
em_esthum19:*
em_esthum10:*
em_esthum20:*
em_esthum21:*
                                                                                                                                                           em_estro9:*
em_estro10:*
em_estro11:*
em_estro12:*
em_estro13:*
em_estro14:*
                                                                                                                                                                                                                                                                                                       em_estpl1:*
em_estpl2:*
em_estpl3:*
em_estpl4:*
em_estpl5:*
em_estpl6:*
                                                                                                                                                                                                                                                                em_estpl10:*
em_estro1:*
em_estro2:*
                                                                                                                                                                                                                                                                                                                                                                                                   em_estin2:*
em_estin3:*
em_estin4:*
gb_estro20:*
gb_est25:*
gb_est26:*
gb_est27:*
gb_est28:*
gb_est29:*
gb_est31:*
gb_est31:*
gb_est41:*
gb_est44:*
gb_est44:*
gb_est44:*
gb_est45:*
gb_est45:*
gb_est47:*
                                                                                                                                           em_estro16:*
em_estro17:*
                                                                                                                                                                                                                                                                                                                                                                                                                           em_esthum28:*
em_estin1:*
                                                                                                                                    em_estro18:
                                                                                                                                                                                                                  em_estro8:*
                                                                                                                                                                                                                          em_estro7:*
                                                                                                                                                                                                                                  em_estro5:*
em_estro6:*
                                                                                                                                                                                                                                                  em_estro4:*
                                                                                                                                                                                                                                                         em_estro3:*
                                                                                                                                                                                                                                                                                        em_estpl8:*
em_estpl9:*
                                                                                                                                                                                                                                                                                                                                                                    em_estom2:*
em_estov1:*
                                                                                                                                                                                                                                                                                                                                                                                     em_estin5:*
em_estom1:*
                                                                                                                            em_estro19:*
```

```
gb_est48:
    gb_est50:
    gb_est50:
    gb_est51:
    gb_est51:
    gb_est53:
    gb_est55:
    gb_est55:
    gb_est55:
    gb_est56:
    gb_est56:
    gb_est56:
    gb_est60:
    gb_est70:
    gb_est70:
    gb_est70:
    gb_est80:
    gb
 Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed and is derived by analysis of the total score distribution.
                                                             9b_est1110: *
9b_est1110: *
9b_est1110: *
9b_est1110: *
9b_est111: *
9b_htt: *
em_gss_fun: *
em_gss_fun: *
em_gss_hum5: *
em_gss_hum6: *
em_gss_hum6: *
em_gss_hum6: *
em_gss_hum6: *
em_gss_hum7: *
em_gss_hum6: *
em_gss_hum7: *
em_gss_for: *
```

```
KEYWORDS
SOURCE
ORGANISM
                                                                                       RESULT 1
B77695
LOCUS
DEFINITION
             REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Result
                                                                   VERSION
                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                            , 0
                                                                                                                                                    ဂ ဂ
                                                                                                                                                                       O
                                                                                                                                                                                                          a
                                                                                                                                                                                                                                     O
                                                                                                                                                                                                                                                                000
                                                                                                                                                                                                                                                                                          o o
                                                                                                                                                                                                                                                                                                                              0000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                   541.4
186.8
178.6
171.4
                                                                                                                                                                                                                                                                                                                                          103.6
103.4
103.4
103.4
98.4
98.2
                                                                                                                                                                                                                                                                                                                                                                                          162
149
146
113.2
110.8
110.6
109.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score
                                                                                                                                                    sequence.
B77695
             1 (bases 1 to 543)
Rounsley, S.D., Field, C.E.,
                        Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Society, eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                       B77695
T28K14TF TAMU
                                                                   B77695.1
                                               Arabidopsis thaliana
                                                     thale cress.
Ġ
      Berry, K.,
ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                         . .
9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                   GI:2774334
      Granger, D.,
                                                                                                                                                                                                                                    468
987
1092
1190
1225
                                                                                       Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                               ģ
                                                                                                                                                                                                                                                                                                        220
119
120
219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ħ
                                                                                                                                                                                                                                                               CNS01100
CNS0207
AV717372
CNS020X7
AW759817
CNS0203BD
CNS0167M
CNS0167M
CNS0167M
CNS0167M
CNS0167M
CNS0167M
CNS0020D1
CNS0020D1
CNS0020D1
CNS0020D1
                                                                                                                                                                                                                                                                                                                                                                                         BF324723
BF050501
BG316131
BF05296
AQ689106
CNS00EVL
CNS00EVL
CNS002LJ
BG043191
                                                                                                                                                                                     CNS04D0K
B11102
CNS01100
CNS01ZGM
AW221826
CNS014PQ
CNS020K7
CNS020N7
CNS020N7
CNS0161D
CNS0039G
A1993784
                                                                                                                                                                                                                                                                                                                                                       AW398669
BF052051
AW615836
AW615967
BG448552
                                                                                                                                                   CNS0161D
CNS0021J
AQ258984
B11102
                                                                                                                                                                              BE039087
     Suh, E., Wible, C., Adams
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUMMARIES
                                                                                                                                ALIGNMENTS
                                                                                       thaliana
                                                                                       genomic clone T28K14, DNA
      Adams, M.D.
     Linher, K., Golde s, M.D. and Venter
                                                                                                                                                                                                                                                                                  BG448552 NF036B09R
AL099642 Drosophil
AL069440 Drosophil
AV717372 AV717372
AL175696 Tetraodon
AW690507 NF035D01S
AW759817 S154d10.y
AL064091 Drosophil
AL106396 Drosophil
AL106391 Drosophil
AL106391 Drosophil
AL106391 Drosophil
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Description
                                                                                                                                                                                                                                                                                                                                                               BF052051
AW615836
AW615967
                                                                                                                                                                                                                                                                                                                                                                                         AL061936
BG043191
                                                                                                                                                   BE039087
AL106171
AL061936
AQ258984
B11102 F1
                                                                                                                                                                                                  AL175696
AL206908
AL106171
                                                                                                                                                                                     AL063921
AI993784
                                                                                                                                                                                                                      AW221826
AL104456
                                                                                                                                                                                                                                                  AL285149 Tetraodon
B11102 F19C22-T7 I
                                                                                                                                                                                                                                                                                                                                                                                                                                                B77695 T28K14TF TA
BE315722 NF025D11L
BF324723 su14f03.y
                                                                                                                                                                                                                                                                AL063921
                                                                                                                                                                                                                                                                             AL057419
                                                                                                                                                                                                                                                                                                                                                                                  AW398669
                                                                                                                                                                                                                                                                                                                                                                                                        AL069706
                                                                                                                                                                                                                                                                                                                                                                                                               AL069706
                                                                                            16-JAN-1998
                                                                                                                                                   087 AB09E01 A
171 Drosophil
936 Drosophil
984 nbxb0021P
2 F19C22-T7 I
                                                                                                                                                                                    Drosophil
Drosophil
701514527
                                                                                                                                                                                                                             Tetraodon
EST298637
                                                                                                                                                                                                                                                               Drosophil
Tetraodon
Drosophil
                                                                                                                                                                                                                                                                                                                                                                    Drosophil
st98a12.y
EST309169
EST437298
EST437298
                                                                                                                                                                                                                                                                                                                                                                                                                                    sab76f08
             Golden, K
                                                                                                                                                                                                         Tetraodon
                                                                                                                                                                                                                Tetraodon
                                                                                                                                                                                                                       Drosophil
                                                                                                                                                                                                                                                                                                                                                               EST325333
                                                                                                                                                                                                                                                                                                                                                                                                        Drosophil
                                                                                                                                                                                                                                                                                                                                                                                                              Drosophil
                                                                                                                                                                                                                                                                                                                                                                                                                      nbxb0078N
                                                                                                                                                                                                                                                                                                                                                                                                                            EST437526
                                                                                                                                                                                                                                                                                                                                   BASE COUNT
ORIGIN
                                                                                     Qy
                                                                                                               Qγ
                                                                                                                               뫄
                                                                                                                                            δÃ
                                                                                                                                                                      δÃ
                                                                                                                                                                                     В
                                                                                                                                                                                                 20
                                                                                                                                                                                                                B
                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                       Qγ
                    밁
                                              В
                                                           οy
                                                                         멍
                                                                                                    Вþ
                                                                                                                                                          Вp
                                                                                                                                                                                                                                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                              FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JOURNAL
                                 4995
                                                            4935
                                                                                       4875
                                                                                                                  4815
                                                                                                                                                                        4695
                                                                                                                                                                                                   4635
                                                                                                                                                                                                                             4575
                                                                                                                                                                                                                                                         4515
                                                                                                                                                                                                                                                                                     4455
                                                                                                                                                                                                                                                                                                                                                                                                        source
                                               481
                                                                         421
                                                                                                    361
                                                                                                                               301
                                                                                                                                                                                     181
                                                                                                                                                                                                                121
                    541
                                                                                                                                                          241
                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                       μ.
                                 aaa
                    AAA
                                 4997
                    543
                                                                                                                                                                                                                                                                                                                                          198
```

```
Query Match
Best Local Similarity
Matches 542; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccctaaagccgttgaagagcttagggtaagataattataacagcacaagttaattactac 4514
                                                        ggttataaatgaaactcttcgattgggaaatgtagttaggtttttgcatcgcaaagcact 4874
                                                                                                                                                                                                                                                                                                 GAGCATCTTGAGATCGCGAGGGCCAAGAAGGAACTAGGAGAGTCAGAATTAAATTGGGAT 240
                                                                                                                                                                                                                                                                                                                                                         CAAATTGTTACGTATTATAAGTTATTATAGAATTATTCTATTAGAATATACGATGAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                     caaattgttacgtattatataagttattatagaattattctattagaatatacgatgaaa 457/
                                                                                                                                                                                                                                                     GAATATTGAAATCTTATTGGATGAAAAATATTAAAAATAATTTACATTTCTTAAAGTTTGGA
            gaatattgaaatcttattggatgaaaaatattaaaaataatttacatttcttaatgttgga
                                                                                                                                                                                         gagcatcttgagatcgcgagggccaagaaggaactaggagagtcagaattaaattgggat 4694
                                                                                                                                                                             9712 Medical Center Dr., Rockville,
Tel: 301 838 0200
Fax: 301 838 0208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Contact: Steve Rounsley
Department of Eukaryotic Genomics
The Institute for Genomic Researc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A BAC End Sequence I
Arabidopsis Genomic
Unpublished (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    quality sequence stop: !
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    End Sequence Database for Identifying Minimal Overlaps dopsis Genomic Sequencing. Update 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Arabidopsis thal
/strain="Columbia"
/db_xref="taxon:3702"
/clone="T28K14"
/clone_lib="TAMU"
/sex="hermaphrodite"
/sex="hermaphrodite"
/note="Vector: BeloBACII; S
; Produced by Rod Wing"
a 57 c 95 g 193 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  മ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequencing. Update
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 541.4;
Pred. No. 3e-8
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Research
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3e-81;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        thaliana"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Site_1: HindIII; Site_2: HindIII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         543;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                     4934
                                                                                                                                                                             360
                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
```

```
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE315722
LOCUS
                                                                                                                                                 Ş
                                                     밁
                                                                                 QY
                                                                                                                  В
                                                                                                                                                                                    В
                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                        ₽,
                                                                                                                                                                                                                                                                                                                                                      ş
                                                                                                                                                                                                                                                                                                                                                                                          밁
 RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                          3502 aggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatcagctgat 3563
                                                                                                                                                                                                                                                    3562 gctggacttaatagattcatattacaaaacgaaggaaggctctttgaatgtagttatcct 3621
                                                                                                                                         3742 cttaaagatgttgagagacatactttgtttgttcttgattcttggcaacaaaactctatt 3801
                                                                                                                                                                                                                source
                                                                                     3802 tt 3803
                                                                                                                                                                                                                                                                                                                          382
                                                                                                                                                                                        502
                                                                                                                    322 AGGTATGGTAAAATTTACAAATCAAACTTGTTTGGTGGACCAACAATAGTTTCAGCAGAT 381
                                                     622 TT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                    AGAGACATGCGTAATATATCACTCAATTTTTTTGTGTCATGCTAGGCTTAGAACACATCTA
                                                                                                                                                                                                                                                                                                                        GCAGGATTGAATAGGTTCATATTACAAAATGAAGGGAAATTATTTGAGTGCAGTTATCCT 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                           230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Contact: May GD
Contact: May GD
Plant Biology Division
The Samuel Roberts Noble Foundation
The Samuel Roberts Noble Foundation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Medicago truncatula
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnollophyta; eudicotyledons; core eudicots;
Rosidae; eurosids I; Fabales; Fabaceae; Papilionoideae; Medicago.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Torres-Jerez,I., Scott,A.D., Harris,A.R., Gonzales,R.A., Bell,C.J. Flores,H.R., Inman,J.T., Weller,J.W. and May,G.D. Expressed Sequence Tays from the Samuel Roberts Noble Foundation Medicago truncatula leaf library
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BE315722 642 bp mRNA EST 14-JUL-2000 NF025D11LF1F1090 Developing leaf Medicago truncatula cDNA clone NF025D11LF 5', mRNA sequence.
BE315722 BE315722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Insert Length: 642 Std Error: 0. Plate: 025 row: D column: 11 Seg primer: TCACACAGGAAACAGCTATGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Tel: 580 221 7391 Fax: 580 221 7380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BE315722.1 GI:9189499
EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Medicago Genome Initiative accession: Insert Length: 642 Std Error: 0.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              barrel medic
                                                     623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Email: gdmay@noble.org
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (bases 1 to 642)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="Vector: Lambda Zap; Contains a mixture of very
young, developing, mature and senescing leaves."
110 c 109 g 213 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Medicago truncatula"
/db_xref="taxon:3880"
/clone="NF025D11LF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /clone_lib="Developing leaf"
/tissue_type="leaf"
/dev_stage="Pooled developmental"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . .642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2.7%;
76.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 186.8; DB 1 Pred. No. 9.5e-22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            73402,
                                                                                                                                                                                                                                                                                                                                                                                                                                                           72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MGI:S:16068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 642;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                    621
                                                                                                                                                                                      561
                                                                                                                                                                                                                                                                                                                                                                                                                                                         0,
                 δã
                                                    밁
                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
                                                                                                                                                                                                      ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                     BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BF324723
                                                                                                                                    Query Match
Best Local
                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                  218
gctggacttaatagattcatattacaaaacgaaggaaggctctttgaatgtagttatcct
```

```
3502 aggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatcagctgat 3561
AGGTATGGTACAATTTACAAGTCAAAACTGTTTGGGGAGCCAGCAATAGTGTCAGCAGAT 277
                                                                                                                                                                                               235;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               l (bases 1 to 667)
Shoemaker, R., Keim, P., Vodkin, L., Erpelding, J., Coryell, V., Khanna Shoemaker, R., Keim, P., Vodkin, L., Kucaba, T., Martin, J., Beck, C., A., Bolla, B., Marra, M., Hillier, L., Kucaba, T., Martin, J., Beck, C., Wylie, T., Underwood, K., Steptoe, M., Theising, B., Allen, M., Bowers Y., Person, B., Swaller, T., Gibbons, M., Pape, D., Harvey, N., Schurk, R., Ritter, E., Kohn, S., Shin, T., Jackson, Y., Cardenas, M., McCann, R., Waterston, R. and Wilson, R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Glycine max
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicota;
Rosidae; eurosida;; Fabales; Fabaceae; Papilionoideae; Glycine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BE934723 667 bp mRNA EST 21-NOV-2000 Su14fG3.y1 Gm-c1066 Glycine max cDNA clone GENOME SYSTEMS CLONE ID: Gm-c1066-1781 5' similar to TR:064989 064989 STEROID 22-ALPHA-HYDROXYLASE. [1] ;, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This clone is available through: Genome Systems, Inc. 4633 World Parkway Circle St. Louis, Missouri 63134 For further information call: (800) 430-0030 or (314) 427-3322 PAX: (888) 919-3324 or (314) 427-3324 or contact: clones@genomesystems.com or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Contact: Shoemaker R/Public Soybean EST Project Public Soybean EST Project Washington University School of Medicine 4444 Forest Park Parkway, Box 8501, St. Louis, MO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         info@genomesystems.com web site: www.genomesystems.com
High quality sequence stop: 420.
    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tel: 314 286 1800
Fax: 314 286 1810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       soybean
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BF324723.1
                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             194
                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //lab_host="bH10B"
//lab_host="b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     est@watson.wustl.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of the pBluescript vector. The ligated cDNA fragments were transformed into DH10B host cells (GibcoBRL). This library was constructed in the laboratory of Dr. Randy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /tissue_type="Leaf and shoot tip, salt stressed, 2 week
old seedling"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Shoemaker.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /organism="Glycine max"
/db_xref="taxon:3847"
/clone="GENOME SYSTEMS CLONE ID:
/clone_lib="Gm-c1066"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .667
                                                                                                                                                                                                                                            2.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                               0;
                                                                                                                                                                                                                                            Score 178.6; DB 1 Pred. No. 2.3e-20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        141 g
                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             177 t
                                                                                                                                                                                                                                                                                         DB 147;
                                                                                                                                                                                               94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gm-c1066-1781"
                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                    Length 667;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  63108, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              restriction site
                                                                                                                                                                                               0
                                                                                                                                                                                               Gaps
                                                                                                                                                                                               0
```

```
RESULT
BF050501
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
AUTHORS
                                                                                                                                                                 BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
   밁
                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
JOURNAL
                                                                                           Query Match
Best Local
                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             278
                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTGAAAGAGGTGGAGAAGCTATCCCTCTTGGTTCTGAACTCTTGGAGCCAAGATTGCATA 517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cttaaagatgttgagagacatactttgtttgttcttgattcttggcaacaaaactctatt 380:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTCTCAGCCCAAGATGAAGCTAAGAAGTT 546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGAGACATGCGGGTTATATCACTCAACTTTCTAAGCCACGCCAGGCTCAGAACACACCTC 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGAAGCATCGGTGGAATACTAGGAAAATGGTCCATGTTGGTCTTAGTTGGTGACATGCAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCAGGACTCAACAGGTTCATTCTACAAAACGAAGGGAAATTGTTCGAGTGCAGCTATCCT 337
                                                                          220;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BF050501 533 bp nkwm
EST435659 tomato developing/immature green fruit Lycopersicon
comparison cDNA clone cLEM18G22 5' sequence, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Contact: David Frisch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Generation of ESTs from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 (bases 1 to 533)
Alcala,J., Vrebalov,J., White,R., van der Hoeven,R.S., Holt,I.E., Liang,F., Hansen,T.S., Craven,M.B., Bowman,C.L., Ronning,C.M., Nierman,W., Fraser,C.M., Martin,G.B., Giovannoni,J.J. and Tanksle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BF050501
BF050501.1 GI:10804397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Lycopersicon esculentum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    toma to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         100 Jordan Hall, Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lycopersicon
                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          lemson University Genomics Institute lemson University
                                                                                                                                                                                  172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      864 656 4366
864 656 4293
                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dfrisch@CLEMSON.EDU
                                                                                                                                                                          /note-"Vector: pBluescriptSKmCUadapt; Site_1: EcoR1; Site_2: Xhol; Fruit were tagged at 5 dpa (0.5 cm) and harvested at 7 day intervals through 35 dpa. Equal masses of tissue from each stage were combined (including seeds and locules) prior to mRNA isolation."
                                                                                                                                                                                                                                                                                     /clone_lib="tomato developing/immature green fruit"
/tissue_type="fruit"
/dev_stage="immature green (5-35 days post-anthesis)"
/lab_host="SOLR"
                                                                                                                                                                                                                                                                                                                                                              /db_xref="taxon:4081"
/clone="cLEM18G22"
                                                                                                                                                                                                                                                                                                                                                                                                /organism="Lycopersicon
/cultivar="TA496"
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                        2.5%;
73.1%;
                                                                     Score 171.4; DB 14:
Pred. No. 3.7e-19;
D; Mismatches 81;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tomato fruit tissue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sc
                                                                                                                                                                                                                                                                                                                                                                                                                 esculentum"
                                                                                                          DB 143;
                                                                         Indels
                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                immature green
                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and Tanksley
                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     397
                                                                       0,
```

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                                                                                                                                                                                                                              FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BG316131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rocus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AUTHORS
                                                                                                                                                                                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         533 C 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              c 3797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    atcctagaagtataggtgggattcttgggaaaatggtcgatgcttgttcttgttggtgaca 3676
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CAGATGCAGGGCTAAACAGATACATTCTGCAGAATGAAGGGAGATTATTTGAGTGTAATT 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGCATAGAGATATGAGGATGATTCCTCTGAATTTTTTGAGCAATGCTAAGGCTAAGGAATC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATCCAAGAAGTATAGGTGGGATACTTGGTAAATGGTCTATGTTAGTTCAAGTTGGACAAA 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BG316131
BG316131.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BG316131 522 bp mRNA EST 26-FEB-2UU1 sab76f08.y1 Gm-c1032 Glycine max cDNA clone GENOME SYSTEMS CLONE ID: Gm-c1032-2967 5' similar to TR:064989 064989 STEROID 22-ALPHA-HYDROXYLASE. [1] ;, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                             This clone is available through: Genome Systems, Inc. 4633 World Parkway Circle St. Louis, Missouri 63134 For further information call: (800) 430-0030 or (314) 427-3222 FAX:(888) 919-3324 or (314) 427-3324 or contact: clones@genomesystems.com or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Tel:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Contact: Shoemaker R/Public Soybean EST Public Soybean EST Project Washington University School of Medicine 4444 Forest Park Parkway, Box 8501, St. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ,Y., Person,B., Swaller,T., Gibbons,M., Papé,I,R., Ritter,E., Kohn,S., Shin,T., Jackson,Y., R., Waterston,R. and Wilson,R.
Public Soybean EST Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Shoemaker, R., Keim, P., Vodkin, L., Erpelding, J., Coryell, V., Khanna, A., Bolla, B., Marra, M., Hillier, L., Kucaba, T., Martin, J., Beck, C. Wylie, T., Underwood, K., Steptoe, M., Theising, B., Allen, M., Bowers, Y., Person, B., Swaller, T., Gibbons, M., Pape, D., Harvey, N., Schurk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Spermatophyta; Magnoliophyta;
Rosidae; eurosids I; Fabales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Glycine max
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EST
                                                                                                                                                                                                                                                                                                                         info@genomesystems.com web site:
High quality sequence stop: 388.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           soybean
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (bases 1 to 522)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              314 286 1800
314 286 1810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           est@watson.wustl.edu
/note="Vector: pBluescript II XR; Site_1: EcoRI; Site_2: XhOI; This cDNA library was constructed from mRNA isolated from cotyledons of 8-day-old 'Williams' seedlings which were propagated on paper towels with distilled water for 3 days (etiolated), then greenhouse grown for 5 days in potting soil. The cotyledons were flash-frozen in liquid
                                                                                                                                                               /tissue_type="Cotyledons of 8-day-old 'Williams'
seedlings"
                                                                                                                                                                                                            /clone="GENOME SYSTEMS CLONE ID: Gm-c1032-2967"
/clone_lib="Gm-c1032"
                                                                                                                                                                                                                                                        /organism="Glycine max"
/db_xref="taxon:3847"
                                                                                                                                       /lab_host="DH10B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; yta; Magnoliophyta; eudicotyledons; core eudicots;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GI:13125561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fabaceae;
                                                                                                                                                                                                                                                                                                                                                                         www.genomesystems.com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EST Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Papilionoideae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Louis, MO 63108,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cardenas, M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Glycine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            472
```

```
RESULT
BF052296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
ORIGIN
                                               REFERENCE
                                                                                                                              KEYWORDS
                                                                                                                                                                                      DEFINITION
                                                                                                                                                            ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                AUTHORS
                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                      3781 tcttggcaacaaaactctattttctctgctcaagacgaggccaaaaaggt 3830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  127
                                                                                                                                                                                                                                                                          247
                                                                                                                                                                                                                                                                                                                                                                                                                                              67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7
                                                                                                                                                                                                                                                                                                                                                ctctttgaatgtagttatcctagaagtataggtgggattcttggggaaatggtcgatgctt 3660
                                                                                                                                                                                                                                                                                                                                                                                      GTCTTAGTTGGTGACATGCATAGAGACATGCGGGTTATATCACTCAACTTTCTAAGCCAC 186
                                                                                                                                                                                                                                                                                                                                                                                                     CCAGCAATAGTGTCAGCAGATGCAGGACTCAACAGGTTCATCTACAAAACGAAGGGAAA 66
                                                                                                                                                                                                                                                                         TCTTGGAGCCAAAATTCCATATTCTCAGCCCAAGATGAAGCTAAGAAGTT 296
                                                                                                                                                                                                                                                                                                                                GCCAGGCTCAGAACACCTCTTGAAAGAGGTGGAGAAGCAATCCCTCTTGGTTCTGAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                             TTGTTCGAGTGCAGCTATCCTAGAAGCATCGGTGGAAATACTAGGAAAATGGTCCATGTTG 126
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnollophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum.

1 (bases 1 to 477)
van der Hoeven, R.S., Bezzerides, J., Holt, I.E., Liang, F., Cho, J., Utterback, T., Hansen, C.L., Doan, B., Bougri, O., Buell, C.R., Ronning, C.M., Fry, W.E., Tanksley, S.D. and Baker, B.
                                                                                                                                                       BF052296 477 bp mkNA
EST437526 potato leaves and petioles Solanum tuberosum cDNA clone
cSTB3101 5' sequence, mRNA sequence.
                                                                                                 potato.
Solanum tuberosum
                                                                                                                                EST
                                                                                                                                             BF052296.1 GI:10806192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2.48;
72.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0,:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 162; DB 152;
Pred. No. 1.4e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 522;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0,
```

Ş В Ş 밁 Ş 밁 QΥ 밁

밁

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                               VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  덩
                                                                   COMMENT
                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                    AQ689106
                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
JOURNAL
                                                                                  JOURNAL
                                                                                                         TITLE
                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3502 aggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatcagctgat 3561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3742 cttaaagatgttgagagacata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                agaagtataggtgggattcttgggaaatggtcgatgcttgttcttgttggtggccatgcat 3681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gctggacttaatagattcatattacaaaacgaaggaaggctctttgaatgtagttatcct 3621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AGGTATGGGAAAATTTTCAAGTCAAATTTGTTTGGAGAGCCAACAATAGTTTCAGCAGAT 275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTAAGTGAAGTTGAAAAGCATA 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGAAGTATAGGTGGGATACTTGGTAAATGGTCTATGTTGGTTCAAGTTGGACAAATGCAT 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCAGGGCTTAACAGATACATTCTGCAGAATGAAGGGAGATTATTTTGAGTGTAATTATCCA 335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AGAGATATGAGGATGATTTCTCTGAATTTTTTGAGCAATGCTAGACTCANGAATCAACTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              191;
                                                                                                                                                                                                                                                                                                                  AQ589106 589
nbxb0078N12r CUGI
nbxb0078N12r, DNA
                                                             1 (bases 1 to 589)
Wing,R.A. and Dean,R.A.
A BAC End Sequencing Framework to
Unpublished (1998)
Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Contact: Cathy Ronning
Contact: Cathy Ronning
The Institute for Genomic Research
For clone info: please contact Research Genetics, Libraries
Division tel 1-800-711-6195, email cdna@resgen.com.
Clemson University Genomics Institute
Clemson University
Illo Jordan Hall, Clemson, SC 29634, U.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Generation of ESTs
Unpublished (2000)
Contact: Cathy Ronn
                                                                                                                                                          Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Ehrhartoideae; Oryzeae; Oryza.
                                                                                                                                                                                                                          Oryza sativa
                                                                                                                                                                                                                                            Oryza sativa.
                                                                                                                                                                                                                                                                                      AQ689106.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Xho1: Tissue was supplied by Dr. Fry (Cornell Universit: Leaflets and petioles were isolated from 8 week old greenhouse grown plants. The plants were watered and fertilized freely. The tissue was immediately frozen in liquid nitrogen."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /lab_host="SOLR"
/lab_host="SOLR"
/note="Vector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
/note="Vector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Solanum tuberosum"
/cultivar="Kennebec"
/db_xref="taxon:4113"
/clone="cSTB3101"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /dev_stage="8 weeks old plants"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /clone_lib="potato leaves and petioles"
/tissue_type="leaflets and petioles"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2.2%;
72.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nitrogen."
97 g
                                                                                                                                                                                                                                                                                                                         sequence
                                                                                                                                                                                                                                                                                                                                   bp DNA GSS vi-Jur
Rice BAC Library Oryza sativa genomic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        from potato leaves
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 149; DB 143;
Pred. No. 2.1e-15;
0; Mismatches 71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   161 t
                                                                                                       Sequence the Rice Genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and petioles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
```

```
рb.
                                                                                                                                                                                                                                                9
                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
ORIGIN
    밁
                                    δÃ
                                                                                밁
                                                                                                                  δÃ
                                                                                                                                                                   B
                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches 288;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         3619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3499 tacaggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatcagct 3558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                145
    505
                                                                                  445
                                                                                                                                                                                                                                                  325
                                                                                                                                                                                                                                                                                                                                  265
                                                                                                                                                                                                                                                                                                                                                                                                                 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     atttctctgctcaagacgaggccaaaaaggt------ttttattttt 3840
                                                                                                                                                                                                                                                CTCCTCCCGAGGTCGAGCGCCACACCCTCCTCGTNCTCCGCGCCCTGGCCCCCCTTCCTCC 384
                                                                                                                                                                                                                                                                                                                                                                cctagaagtataggtgggattcttgggaaatggtcgatgcttgttcttgttggtgacatg 3678
                                                                                                                                                                                                                                                                                      ctacttaaagatgttgagagacatactttgtttgttcttgattcttggcaacaaaactct 3798
                                                                                                                                                                                                                                                                                                                                CCGCGCAGCATCGGCATCCTGGGCAAGTGGTCCATGCTGGTCCTCGTCGGGGACCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GACGCGGGGCTCAACCGGTACATCCTGCAGAACGAGGGGAGGCTGTTCGAGTGCAGCTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TGCAGGTACGGGAAGATATACCGGTCGAGCCTGTTCGGGGAAGCGGACGGTGGTGTCGGCG 144
    TGCGTGCGTGCAGTTCAACCTGATGGCGAAGAACATAATGAGCATGGACCCCGG
                                                                                AGCATGCATATCAATCAGCTCGCTCTAGCGATCAATATCAATGAAACGCGCGTTTGCG 504
                                                                                                                      ACCTTCTTCGCTCAGCACCAAGCCAAGAAGGTACAACACACATCGTCCTCCATTAAGTTG 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             primer:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   quality sequence stop: 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note-"vector: pBeloBAC11; Site_1: HindIII; Site_2: HindIII; Rice is one of two most popular grains in the world. Half of the world population especially those inhabiting highly populated areas of the humid tropics and subtropics, rely on rice as their primary source of carbohydrate. Monocotyledonous rice is a diploid plant (2n=24) with a haploid genome equivalent of 431 Mp (Arumuganathan and Earle, 1991). The relatively small genome of rice, three times larger than that of Arabidopsis, makes it suitable for genomic studies. In order to facilitate positional cloning, physical mapping and genome sequencing of rice, we have constructed a BAC library from Orvas sation. Minocohare variety who
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BAC ends
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              library from Oryza sativa, Nipponbare variety. The library contains 36,864 clones with an average insert size of 128.5 Kb providing 10.9 haploid genome equivalents. The deep coverage allows the isolation a particular sequence with a probability of 99.9%. Two high density filters, each containing 18,432 clones (doubly spottled), represent the whole library for colony screening. 1811 c 1819 114 t 1 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Oryza sativa"
/strain="Japonica"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /tissue_type="Leaf"
/lab_host="E. coli DH10B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone="nbxb0078N12r"
/clone_lib="CUGI Rice BAC Library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /cultivar="Nipponbare"
/db_xref="taxon:4530"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2.18; 57.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGAAACAGCTATGACCATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. 6.7e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches 191; Indels 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                204
                                                                                                                                                                                                                                                                                                                                                                                                                 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ۲
Ş
                                        В
                                                                            20
                                                                                                                         밁
                                                                                                                                                               ğ
                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                             οy
                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3961 agaagaagaaacagagc
                                                                                                                                                                                                             1745
                                                                                                                                                                                                                                                                                         1100 TWWTATWTWTTTWTTTTWWTATWTTAWATATATAAWTAATTWWTWTATATWTAWWWTAT 1041
                                                                                                                                                                                                                                                                                                                                                                                             1625 tagtatgtgattattccaaatacatactttggatgtttaaacttaatcttgtttcttcct 1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
1865 caaatattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacat 1920
                                                                                                                                                                                                                                                              1040 WATATATTAWTTTWTAAAATATAWWTTAATAAATATATWTAWWATAWATATAWATAWAA 981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               565 GGGAGAAGAGACGGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hes 232;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo. NY. The library is named RPCI-98 and was constructed by partial ECORI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; cn bw sp, the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the Library and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                 acceptatetttttttttctg 186
                                                                                                                                                                                                           aggataaacctaatgactttaattttttgaaaaatgtaacccttttactcatagattaatt 180
                                                   TTTWTTTWTATWTWTTTATATWWTWWAAAAWAWWAAWTWTATTTTTWTTATWATTWATA 861
                                                                                                                                                          GSS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Ins
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Drosophila melanogaster genome survey sequence T7 end of BAC:
BACR29B23 of RPCI-98 library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (02-JUN-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : seqref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CNS00EVL

    Web : www.genoscope.cns.fr)

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Genoscope.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AL069706.1 GI:4949849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    genomic survey sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /clone_lib="RPCI-98"
/clone="BACR29B23"
/note="end : T7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Drosophila
/db_xref="taxon:7227"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1101 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   91 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            118; Mismatches 297; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 113.2; DB 2
Pred. No. 2.1e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             melanogaster'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 219; Length 1101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   232 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             04-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Insecta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1;
```

```
RESULT
CNSOOEVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCESSION
VERSION
KEYWORDS
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            岛.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1925
                                                                                                                                                                                                                                                       source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTAMATTTTTTWIWIATIWWIATATWATWWIWIWIWIWITTWATWIATTTATWIWT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 atacattatgaaccaataatagttggtgaattcaaatatctccattaatatttttgaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTTTTWATTWATAAWTTTWTTTWWAWATTWWKKKKKKAWADTGAGARA 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ttttgttgtggaatggaagtagtaatatacattaagcaaattttaaaa 2271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ttaacagaaacttccaaattttttttttttttatggaacaagaaataacagatagaaaacta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAATATTTTTTTATAATHAAHWAWATTTATAWATTAATAHWITTWTAAATHWTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tttaatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaata 1984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      melanogaster genome using these BACS. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osogawa and Aaron Mammoser in Pleter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial ECORI digestion of Drosophila DNA provided by the BDGP from the 1sogenic strain y2; on bw sp. the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library or filters for hybridization from the BACPAC Resource Center can be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     - Web: www.genoscope.cns.fr)
- Web: www.genoscope.cns.fr)

Determination of this BAC-end sequence was carried out as part collaboration with the Berkeley Drosophila Genome Project (BDG The BDGP is constructing a physical map of the Drosophila The BDGP is constructing a physical map of the Drosophila of the Drosophila The BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructing a physical map of the Drosophila of the BDGP is constructed by the BDGP 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CNS00EVL 1101 bp DNA GSS 04-JUN-1999 Drosophila melanogaster genome survey sequence T7 end of BAC: BAC:29B23 of RPCI-98 library from Drosophila melanogaster (fruit fly), genomic survey sequence.
AL069706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Submitted (02-JUN-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : segref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Genoscope
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Ins
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AL069706.1 GI:4949849 GSS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (bases 1 to 1101)
                                 419
                                                                                                                                                                                                                                                                                  at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
Location/Qualifiers
                                 a
                                                                                                                               /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone_lib="RPCI-98"
                                                               /note="end : T7"
                                                                                                     /clone="BACR29B23"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         melanogaster
                          9
                                 299
                                 4
                              232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       segref@genoscope.cns.fr
                                 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (BDGP).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                part of a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2043
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         801
```

COMMENT

REFERENCE

Genoscope.

JOURNAL TITLE AUTHORS

Direct Submission
Direct Submission
Submitted (02-JUN-1999) Genoscope - Centre
Submitted (02-JUN-1999) Genoscope - Centre
Submitted (102-JUN-1999) Genoscope - Centre
Submitted (102-JUN-1999) Genoscope - Centre

Web : www.genoscope.cns.fr)
 Determination of this BAC-end sequence was collaboration with the Berkeley Drosophila
 The BDGP is constructing a physical map of

carried out as Genome Project the Drosophila

(BDGP).

of a

National de Sequencage segref@genoscope.cns.fi

```
CNS0021J/c
                                                                                                           ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                             Бр
                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                             SOURCE
                                                                                              KEYWORDS
                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                     RESULT
                                                                ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1873
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1693
                                                                                                                                                                                                                                                                                2053
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1056 AWWAATTAWTTATATATWTAAWATAWWAAAAWAAAWAWATAWWAA 1101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              816
                                                                                                                                                                                                                                                                                                                                                                                                                                                    876
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             581
                                                                                                                                                                                                                                                                                                                               996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    461 ТWTMMMMMWWAATWTWWAAAWAAWTTATWAATWAAAAAWAWWWWATTTTTWWWWWTWA 520
                                                                                                                                                                                                                                                                                                                                             ataatgtatttcctatgttcttaaaatatttttttttatatttagttataaatacattat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aaagacaaaatttttgaaaaatgttataattttctaacaatattattaaaatatgatgcct 1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WATWAAWAWAWATAWWATATAWWAATAWAWAAAAATWTAATATWAATWATAAWAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aaattaggaattcaatgctatcaatagaagaaacagctgagtattacattttaattt 1932 :| : | : : |: || | : ||: || ||: ||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          aatattaatcatcgaggtaaaaaagttttgtcttattttcgcgatgcatgaaggataaa 1752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gattattccaaatacatactttggatgtttaaacttaatcttgtttcttcctacggtata 1692
                                                                                                                                                                                                                                                                                                                            WTAWTAWATATTTATTAAWWTATATTTAWAAAWTAATATATWATAWWWTAWATATAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TATATAWTWTAWWWATWWAWWWTATAWA-----TAWAATAWAAWAWAWATAAATAWATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tttttgttgccataatgacagcctctacaactgtgatagtcaatttttttctgcaaatatt 1872
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTWTTTWAWWTWTAWTAAAAAAAAWATAATTTAAAWWAATAWATTAAWAATTTAWAAWW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | tiggaatttaataagagcgaacttgtaacattacaatatttatatttagatactagtatgt 1632
                                                                                                                                                                                                                                                                                                                                                                                         WWWTWATATTWTTATTAAAWTWTATWWATTWATTWWAWTWTATAWTTWTATWTATATATW
                                                                                                                                                                                                                                                                                                                                                                                                                                                    CNS0021J 1101 bp DNA
Drosophila melanogaster genome sur
BACROSMIl of RPCI-98 library from
fly), genomic survey sequence.
Drosophila melanogaster
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta;
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 1101)
                                                              fruit fly
Drosophila
                                                                                              GSS.
                                                                                                             AL061936.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                             GI:4940214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 110.8; DB 21.7
Pred. No. 5.3e-09;
"" matches 290;
                                                                                                                                                      survey sequence TET3 end of rom Drosophila melanogaster (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 219;
                                                                                                                                                        melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 1101;
                                                                                                                                                                                     03-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           640
                                                                                                                                                                        BAC
                                                                                                                                                                                                                                                                                                                               1055
                                                                                                                                                                                                                                                                                                                                                                                                                      2052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1;
```

```
RESULT 1
BG043191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
KEYWORDS
                       VERSION
                                          ACCESSION
                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1097
                                                                                                                                                                                                                                                                                                                                                                                 2165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2045
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            977
                                                                                                                                                                                                                                              620
                                                                                                                                                                                                                                                                                                                                                                                                                             740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tttaatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaata 1984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               caaatattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacat 1924
                                                                                                                                                                                                                                                                                                                                                              tacattatgaaccaataatagttggtgaattcaaatatctccattaatattttttgaaat 2104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtatgtttttgttgccataatgacagcctctacaac---tgtgatagtcaattttttctg 1864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TTTAAAAWTAATAAAWTTTTAAAWAAAAAAWTTAAAAAAWTTTTTAAAATTTWATTTWAT 681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAAAATTAAATTAAAAAA - - - TTTTWTAATWTTAWTATWTAAAAAATTTAWWAWTWATWT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AMMATTMAMAMMITATYMTCTTACHATTYTTAACMYCMMMYTAMCMMMMCATTCMCAWTT 918
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTTTTTMWTTTNMMAAATATTHMCACTTTTTCATMCYTTCWTATTTTTCMTMHTTTTTT 978
                                                                                                                                                                                                                                                                                   ttgttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattatataa
                                                                                                                                                                                                                                                                                                                                     TTTAWACTTAAAAAACATAWTTAAATSATTATTAAAAATTTTTAAAATAAWAAATAATTTAA 858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BOEP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial
                  22-ALPHA-HYDROXYLASE. [1] ;, mRNA sequence BG043191 BG043191.1 GI:12489670
                                                                                 BG043191 465 bp mRNA EST 25-JAN-2001 st98a12.yl Gm-c1066 Glycine max cDNA clone GENOME SYSTEMS CLONE Gm-c1066-24 5' similar to TR:064989 064989 STEROID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ECORI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; on bw sp, the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="end : TET3"
7 c 28 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /clone_lib="RPCI-98"
/clone="BACR05N11"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Drosophila
/db_xref="taxon:7227"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                65;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 109.6; DB : Pred. No. 8.5e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              melanogaster"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ς+
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 219; Length 1101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     146 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6;
                                                                                                                                                                                                                                              564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                           ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
```

, O 밁 8 В ρy 밁 Qy 밁 οy 밁 Qy B Š 망 Ş 밁 Ş

밁

RESULT

```
οy
                                                Š
                                                                                                  망
                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOURCE
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                        ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                  5976
                                             6036 gatgatcaaccatttgcttttccttttgttgattttcctaacggtttgcctattagggt 6094
                                                                                                                                                                                                                                                5916 aacaactacatgccgtttggaggagggccaaggctatgtgctggttcagagctagccaag 5975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               source
                                                                                                  152
212 ACGGATCAAGCTTTTGCCTACCCTTTTGTCGACTTCCCCCAAAGGCCTACCCATTAGAGT
                                                                                                                                                                                                   92 AACAACTTTCTTCCGTTCGGAGGAGGACCACGATTATGTGCAGGATCAGAGTTAGCTAAG 151
                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                             ttagaaatggcagtgtttattcatcatctagttcttaaattcaattgggaattagcagaa 6039
                                                                                                  CTTGAAATGGCTGTTTTCATTCACCATCTCATTCTCAACTACCATTGGGAATTGGCTGAT 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Email: est@watson.wustl.edu
This clone is available through: Genome Systems, Inc. 4633 World
Parkway Circle St. Louis, Missouri 63134 For further information
call: (800) 430-0030 or (314) 427-3222 FAX:(888) 919-3324 or (314) 427-3324 or contact: clones@genomesystems.com or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Shoemaker,R., Keim,P., Vodkin,L., Erpelding,J., Coryell,V., Khanna, A., Bolla,B., Marra,M., Hillier,L., Kucaba,T., Martin,J., Beck,C., Wylie,T., Underwood,K., Steptoe,M., Theising,B., Allen,M., Bowers,Y., Person,B., Swaller,T., Gibbons,M., Papé,D., Harvey,N., Schurk,R., Ritter,E., Kohn,S., Shin,T., Jackson,Y., Cardenas,M., McCann,R., Waterston,R., and Wilson,R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Public Soybean EST Project
Washington University School of Medicine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Glycine max
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4444 Forest Park Parkway, Box 8501, Tel: 314 286 1800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Contact: Shoemaker R/Public Soybean
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Public Soybean EST Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Spermatophyta; Magnoliophyta; Rosidae; eurosids I; Fabales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      soybean
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            info@genomesystems.com web site: www.genomesystems.com High quality sequence stop: 415.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (bases 1 to 465)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             314 286 1800
314 286 1810
                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="vector: pBluescript II SK+; Site_1: EcoRI; Site_2: XhoI; The cDNA library was constructed from mRNA isolated from unexpanded leaves and the shoot tips of 2 week old seedling from the cultivar Williams. The 2 week old seedlings were salt stressed in a solution of 500mM NaCl for 3 days prior to harvesting. Complementary DNA was synthesized from mRNA using a primer consisting of a poly(dT) sequence with a XhoI restriction site. EcoRI adapters were ligated to the blunt-ended cDNA fragments followed by XhoI digestion. The cDNA fragments were directionally cloned into the EcoRI-XhoI restriction site of the pBluescript vector. The ligated cDNA fragments were transformed into DH10B host cells (GibcoBRL). This library
                                                                                                                                                                                                                                                                                                                                                                                                                                                                b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 was constructed 
Shoemaker."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Shoemaker
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /clone="GENOME SYSTEMS
/clone_lib="Gm-c1066"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Glycine max"
/db_xref="taxon:3847"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /tissue_type="Leaf and shoot tip,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /lab_host="DH10B"
                                                                                                                                                                                                                                                                                                                              1.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         seedling"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   110
                                                                                                                                                                                                                                                                                                   Score 105.4; I Pred. No. 4.4e.0; Mismatches
                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                87
                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the laboratory of Dr.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                eudicotyledons; core eudi
Fabaceae; Papilionoideae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLONE
                                                                                                                                                                                                                                                                                                                              4.4e-08;
                                                                                                                                                                                                                                                                                                                                                        DB 173; Length 465;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             St. Louis, MO 63108, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EST Project
                                                                                                                                                                                                                                                                                                           46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ID: Gm-c1066-24*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    salt stressed, 2 week
                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        core eudicots;
                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Glycine.
                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          or (314)
270
                                                                                                                                                                                                                                                                                                           0
```

```
REFERENCE AUTHORS
             δÃ
                                                       밁
                                                                                        Ş
                                                                                                                                  밁
                                                                                                                                                                  QY
                                                                                                                                                                                                             В
                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                      Ф
                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOURNAL COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AW398669
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE
                                                                                                                                                                                                                                                                                                                              3556
                                                                                                                                                                                                                                                                                                                                                                                   3496 ttttacaggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatca 3555
3796 tctattttctctgctcaagacgaggccaaaaaggttt
                                                                                                                                                            3616 tatcctagaagtataggtgggattcttgggaaatggtcgatgcttgttcttgttggtgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                                                                    445
                                                                                                                                                                                                                                                                                      325 TGTGACCAAGACCTTAATTACTTCATATTACAAAATGAAGATAAGTTATTTCAGTGTAGT
                                                                                                                                                                                                                                                                                                                                                               265 TGTTCTAGGTATGGGAAAGTGTTCAAGTCACATTTATTTTTCTCCCCAACAGTGGTGTCA 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ON EST309169 L. pennellit trichome, Co. pennellit cDNA clone cLPT4K22 5', mF 1 AW398669.1 GI:6917139
EST.
                                                                                      attctacttaaagatgttgagagacatactttgtttgttcttgattcttggcaacaaaac
                                                       GAGTTTATTAATGATGTTGAAACATTAGCACTTCAGATTCTTCAATCATGGAAAGATAAA
                                                                                                                                                                                                                                                                                                          ACACATAAAAGGCTTAGGAATGTTTCATTATCACTAATCAGCACCATTAAGTCTAAACCT
                                                                                                                                                                                                             TATCCAAAGCCAATTCATGGTATACTTGGCAAAGTTTCATTGCTTGTGGCTGTTGGTGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                           al Similarity
192; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Clemson University
100 Jordan Hall, Clemson, SC
Tel: 864 656 4366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Alcala,J., Vrebalov,J., White,R., Matern,A.L., Lakey,J., Holt,I.E. Liang,F., Hansen,T.S., Upton,J., Ronning,C.M., Craven,M.B., Fujii,C.Y., Bownan,C.L., Nierman,W., Fraser,C.M., Venter,J.C., Martin,G.B., Tanksley,S.D. and Glovannoni,J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheo Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clemson University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Contact: David Frisch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            trichomes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Generation of ESTs from wild tomato (Lycopersicon pennellii)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lycopersicon pennellii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Lycopersicon pennellii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Lycopersicon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          prime
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (bases 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                864 656 4366
864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dfrisch@CLEMSON.EDU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note-"Vector: pBluescript SK-; Site_1: EcoRI; Site_2: XhOI; Leaves of various stages were shaken in liquid nitrogen, shearing off trichomes. This procedure yielded a mixture of cells highly enriched for trichomes, with minor contamination by other types of leaf cells."

111 c 100 g 224 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /clone_lib="L. pennellii trichome, Cornell University"
/tissue_type="trichome"
/dev_stage="mixed stages"
/lab_host="SOLR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Lycopersicon pennellii"
/db_xref="taxon:28526"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /clone="cLPT4K22"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               to 615)
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1.5%;
57.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 105; DB 115;
Pred. No. 5.1e-08;
0; Mismatches 145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EST 07-FEB-2000 Cornell University Lycopersicon , mRNA sequence.
                 3832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 615;
                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                             3675
                                                                                            3795
                                                                                                                                                                                                                                                                                                                            3615
                                                                                                                                  504
                                                                                                                                                                                                             444
                                                                                                                                                                                                                                                                                      384
                                                                                                                                                                                                                                                                                                                                                                                                                                         0
```

```
TITLE
JOURNAL
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 1
BF052051
LOCUS
                               Ş
                                                                          В
                                                                                                         Qy
                                                                                                                                                    Вb
                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                            B
밁
                                                                                                                                                                                                                                                                                                                                                                                                ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM
                                                                                                                                                                     3574 agattcatattacaaaacgaaggaaggctctttgaatgtagttatcctagaagtataggt 3633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                 3754 gagagacata
                                                                                                           3694 agtatotogottaacttottaagtoacgoacgtottagaactattotacttaaagatgtt 3753
                                                                          122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                565
182 GAAAAGCATA
                                                                                                                                                    62
                                                                                                                                                                                                                            N
                                                                                                                                                  CATCAAGTCAGATACTGGGAAGAGGCAAGAAAGTTTT
                                                                        ATGATTTCTCTGAATTTTTTGAGCAATGCTATGCTAAGGAATCAACTTTTAAGTGAAGTT
                                                                                                                                                                                                                            AGATACATTCTGCAGAATGAAGGGAGATTATTTGAGTGTAATTATCCAAGAAGTATAGGT
                                                                                                                                                                                                                                                                                                    136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 (bases 1 to 191)
Alcala,J., Vrebalov,J., White,R., van der Hoeven,R.S., Holt,I.E.,
Liang,F., Hansen,T.S., Craven,M.B., Bowman,C.L., Ronning,C.M.,
Nierman,W., Fraser,C.M., Martin,G.B., Giovannoni,J.J. and Tanksle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BF052051 191 bp mRNA EST
EST437298 tomato developing/immature green fruit
esculentum cDNA clone cLEM25M4 5' sequence, mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Clemson University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Contact: David Frisch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Generation of ESTs from tomato fruit tissue, immature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Lycopersicon esculentum

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;

Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;

Asteridae; euasterids I; Solanales; Solanaceae; Solanum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BF052051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BF052051.1 GI:10805947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       100 Jordan Hall,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Lycopersicon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         comato
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              864 656 4366
864 656 4293
1: dfrisch@CLEMSON.EDU
                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                 65
                                     3763
 191
                                                                                                                                                                                                                                                                                                                                                                                                             /note="Vector: pBluescriptSKmCUadapt; Site_1: EcoR1; Site_2: Xhol; Fruit were tagged at 5 dpa (0.5 cm) and harvested at 7 day intervals through 35 dpa. Equal masses of tissue from each stage were combined (including seeds and locules) prior to mRNA isolation."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="taxon:4081"
/clone="cLEM25M4"
/clone_lib="tomato developing/immature green fruit"
/tissue_type="fruit"
/dev_stage="immature green (5-35 days post-anthesis)"
/lab_host="SOLR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Lycopersicon
/cultivar="TA496"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                      1.5%;
71.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Clemson,
                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                  Score 103.6; DB 143, Pred. No. 8.9e-08; 0; Mismatches 54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           esculentum"
                                                                                                                                                                                                                                                                                                                                       DB 143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                601
                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                       Length 191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lycopersicon
                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and Tanksley
                                                                                                                                                                                                                                                                                                    Gaps
                                                                          181
                                                                                                                                                    121
                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                    0
```

RESULT :

```
οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                     Q
                                                                                                                                                     밁
                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOURCE
                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM
                                                                                                                                                                                                                                                                                                        3676
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               source
                                                                                                  3796
                                                                                                                                                                                                                                                                                                                                                           131
                                                  311
                                                                                                                                                                                                                                                     191
                                                                                                                                                                                                                                                                                                                                                                                                                                                              71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tttacaggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatca 3555
                                                                                                                                                                             attctacttaaagatgttgagagacatactttgtttgttcttgattctttggcaacaaaac 3795
                                                                                                                                                                                                                                                                                                                                                                                        tatcctagaagtataggtgggattcttgggaaatggtcgatgcttgttcttgttggtgac 3675
                                                                                                                                                                                                                                                                                                                                                                                                                                                              TGTGACCAAGACCTTAATTACTTCATATTACAAAACGAAGATAAGTTATTCAGTGTAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CATCAAGTCAGATACTGGGAAGAGGCAAGAAAGTTTT
                                                                                          tctattttctctgctcaagacgaggccaaaaaggttt 3832
                                                                                                                                                                                                                                                                                                TATCCAAAGCCAATTCATGGTATACTTGGCAAAGTTTCATTGCTTGTTGGCTGTTGGCCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGTTCTAGGTATGGGAAAGTGTTCAAGTCACATTTATTTTCCCCCCCAACAGTGGTGTCA 70
                                                                                                                                                  GAGTTTATTAATGATGTTGAAACATTAGCACTTCAGATTCTCCAATCATGGAAAGATAAA
                                                                                                                                                                                                                                                     ACACATAAAAGGCTTAGGAATGTTTCATTATCACTAATCAGCACCATTAAGTCTAAACCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 (bases 1 to 574)
van der Hoeven, R.S., Bezzeredes, J.L., Matern, A.L., Holt, I.E., Liang, F., Hansen, T., Craven, M.B., Bowman, C.L., Ronning, C.M., Nierman, W., Fraser, C.M., Martin, G.B., Giovannoni, J.J. and Tanksley, S.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Lycopersicon esculentum AW615836 AW615836.1 GI:7321721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AW615836 574 bp
EST325334 tomato flower
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Clemson University
100 Jordan Hall, C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Generation of ESTs from tomato flower tissue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lycopersicon esculentum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tel: 864 656 4366
Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clemson University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Contact: David Frisch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Lycopersicon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          dfrisch@CLEMSON.EDU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /dev_stage="0-3mm buds"
/dev_stage="0-3mm buds"
/note="Vector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
/note="Vector: pBlueScript SK(-); Site_1: pBlueScript Sk(-); Site_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /clone_lib="tomato flower buds 0-3
/tissue_type="flower"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="Lycopersicon
/cultivar="TA496"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /clone="cTOA17E20"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="taxon:4081"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 103.4; DB 1
Pred. No. 9.4e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   mRNA
buds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0-3 mm,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     esculentum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   n, Cornell cTOA17E20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      146;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mm, Cornell University"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              University
5', mRNA se
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0-3 mm buds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         574;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0,:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                           130
                                                                                                                                                                                                                                                                                                                                                           190
                                                                                                                                                                                                                                                     250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AW615967
                                                                                                                                        δÃ
                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                     Qy
                                                                                             밁
                                                                                                                                                                                                   뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                           3556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source
                                                                                                                                                                                                   191
                                                                                                                                                                                                                                                                                                        131
                                                                                                                                                                                                                                                                                                                                                                                                        71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11
CATCAAGTCAGATACTGGGAAGAGGCAAGAAAGTTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tomato
```

```
3496 ttttacaggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatca 3555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tctattttctctgctcaagacgaggccaaaaaaggttt 3832
                                                                                                                                                                                                                                                                                                                                      tatcctagaagtataggtgggattcttgggaaatggtcgatgcttgttcttgtttggtgac 3675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TGTGACCAAGACCTTAATTACTTCATATTACAAAACGAAGATAAGTTATTTCAGTGTAGT 130
                                                                                                                 GAGTTTATTAATGATGTTGAAAACATTAGCACTTCAGATTCTCCAATCATGGAAAGATAAA
                                                                                                                                                                   attctacttaaagatgttgagagacatactttgtttgttcttgattctttggcaacaaaac 3795
                                                                                                                                                                                                                                                                                         ACACATAAAAGGCTTAGGAATGTTTCATTATCACTAATCAGCACCATTAAGTCTAAACCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TATCCAAAGCCAATTCATGGTATACTTGGCAAAGTTTCATTGCTTGTGGCTGTTGGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TGTTCTAGGTATGGGAAAGTGTTCAAGTCACATTTATTTTTCCCCCCAACAGTGGTGTCA 70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             van der Hoeven,R.S., Bezzeredes,J.L., Matern,A.L., Holt,I.E., Liang, F., Hansen,T., Craven,M.B., Bowman,C.L., Ronning,C.M., Nierman,W., Fraser,C.M., Martin,G.B., Giovannoni,J.J. and Tanksley,S.D. Generation of ESTs from tomato flower tissue, 0-3 mm buds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lycopersicon 
Eukaryota; Vi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Lycopersicon esculentum AW615967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AW615967 574 bp mRNA EST325333 tomato flower buds Lycopersicon esculentum cDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5 prime sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tel: 864 656 4366
Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Contact: David Frisch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; euasterids I; Solanales; Solanaceae; Solanum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AW615967.1 GI:7321720
EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Email: dfrisch@CLEMSON.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Clemson University Genomics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 100 Jordan Hall,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Lycopersicon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 574)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /tissue_type="flower"
/dev_stage="0-3mm buds"
/dev_stage="0-3mm buds"
/dev_stage="0-3mm buds"
/note="wector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
/note="wector: pBlueScript SK(-); Site_1: EcoR1; Site_2: EcoR1; EcoR1; Site_2: EcoR1; Eco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Lycopersicon
/cultivar="TA496"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /clone_lib="tomato flower buds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone="cTOA17E16"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="taxon:4081"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.5%;
56.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   esculentum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 103.4; DB 118; Pred. No. 9.4e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . EDU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches 146; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3 0-3 mm,
A clone c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      esculentum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EST 24-MAI
m, Cornell University
cTOA17E16 5', mRNA so
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          mm, Cornell University"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          24-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       574;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                     310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     190
                                                                                                                                                                                                                                                                                         250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,:
```

Search completed: September 29, 2001, 11:18:30 Job time: 16099 sec

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                         000000
                                                                                               0000
                                  a a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
             58
57
57
56
56
                                                                                                                                                                                                                                      Issued_Patents_NA:*
1: /cgn2_6/ptodata/1,
2: /cgn2_6/ptodata/1,
3: /cgn2_6/ptodata/1,
4: /cgn2_6/ptodata/1,
5: /cgn2_6/ptodata/1,
6: /cgn2_6/ptodata/1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDENTITY_NUC Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-502-426-1
6888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    September 29, 2001, 06:50:21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        324599 seqs, 94655562 residues
          000000000000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  atgtgggtattatattgttg.....cctagttcaggccaaagctt 6888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /cgn2_6/ptodata/1/ina/5A_COMB.seq:*
/cgn2_6/ptodata/1/ina/5B_COMB.seq:*
/cgn2_6/ptodata/1/ina/6A_COMB.seq:*
/cgn2_6/ptodata/1/ina/6B_COMB.seq:*
/cgn2_6/ptodata/1/ina/BCTUS_COMB.seq:*
/cgn2_6/ptodata/1/ina/PCTUS_COMB.seq:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length DB
       1608
19124
615
636
636
638
638
638
638
638
638
638
7218
8920
8920
8920
8920
8920
665
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
51952
  US-08-622-166A-1
US-08-984-16-28-13
US-08-984-16-28-13
US-08-998-416-186
US-08-998-416-1137
US-08-984-16-1137
US-08-9150-741-1
US-08-917-926-27
US-08-817-926-27
US-08-817-926-27
US-08-817-926-27
US-08-817-926-27
US-08-981-926-27
US-08-981-926-27
US-08-981-926-28
US-08-983-795A-36
US-08-98-390-200-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; Search time 139.83 Seconds (without alignments) 9325.431 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        649198
Sequence 3, Appli
Sequence 1, Appli
Sequence 13, Appl
Sequence 186, App
Sequence 186, Appl
Sequence 1137, App
Sequence 1137, Appli
Sequence 1, Appli
Sequence 1, Appli
Sequence 27, Appl
Sequence 1, Appli
Sequence 36, Appl
Sequence 36, Appli
Sequence 8, Appli
Sequence 1, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Description
```

		·
ATTORNEY, AGENT INFORMATION: NAME: SVENSON, LEONARD R. REGISTRATION NUMBER: 30,330 REFERENCE/DOCKET NUMBER: 01 TELEFAX: (703) 205-8050 TELEFAX: (703) 205-8050 TELEX: 248345 INFORMATION FOR SEQ ID NO: 3: SEQUENCE CHARACTERISTICS: LENGTH: 4937 base pairs TYPE: nucleic acid STRANDEDNESS: double TOPOLOGY: linear MOLECULE TYPE: DNA (genomic) HYPOTHETICAL: NO ANTI-SENSE: NO ORIGINAL SOURCE: ORGANISM: ATABDIADSIS thali STRAIN: CV. COlumbia IMMEDIATE SOURCE: ILEBRARY: Imbids ctil	RESULT 1 US-08-622-166A-3 ; Sequence 3, Application US/08622166A ; Patent No. 595245 ; Patent No. 595245 ; APPLICANT: KONCZ, CSABA APPLICANT: MATHUR, JAIDEEP APPLICANT: SZEKERRS, MIKLOS APPLICANT: ALTMANN, THOMAS TITLE OF INVENTION: NUCLEIC ACID TITLE OF INVENTION: P450-TYPE PR NUMBER OF SEQUENCES: 4 CORRESPONDENCE ADDRESS: ADDRESSEE: Birch, Stewart, Kol. STREET: P.O. BOX 747 CITY: Falls Church STATE: Virginia COUNTRY: USA ZIP: 22040-0747 COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk COMPUTER: IBM PC COMPATIBLE OPERATING SYSTEM: PC-DOS/MS-DO SOFTWARE: Patentin Release #1. CURRENT APPLICATION NUMBER: US/08/622, FILING DATE: 27-MAR-1996	28 56.4 0.8 2960 30 55.6 0.8 701 4 31 55.6 0.8 1852 1 32 55.2 0.8 1511 1 33 55.2 0.8 1511 1 34 55.2 0.8 1511 1 35 55.2 0.8 1511 1 36 55.2 0.8 1511 1 37 55.2 0.8 1511 1 38 55.2 0.8 1851 3 58 0.8 4098 2 39 54.8 0.8 8457 1 40 54.8 0.8 8457 1 40 54.6 0.8 9048 4 43 53.6 0.8 2430 4 45 53.6 0.8 2430 4
ON: NAD R. 30,330 34,70153P AATION: 8000 115 125 125 125 125 126 126 127 128 128 129 129 129 129 129 129 129 129 129 129	A US/08622166A  JAIDEEP JAIDEEP JAIDEER JAIDEER JAIDEER JAIDEER NUCLEIC ACID MOLECULES ENCODING CYTOCHROME P450-TYPE PROTEINS INVOLVED IN THE BRASSINOSTEROID: 4  ESS: Stewart, Kolasch & Birch, LLP 747 747 7ch  DRM: DRTA: DATA: R: US/08/622,166A MAR-1996	PCT-US92-00018-1 US-08-913-842-3 US-08-913-842-3 US-08-998-416-701 US-08-998-416-701 US-08-913-842-6 US-07-967-106-2 US-08-913-842-6 US-08-913-842-6 US-08-913-842-6 US-08-107-755A-8 US-08-107-755A-8 US-08-617-860B-32 US-08-617-860B-32 US-08-617-867B-1 US-08-107-75A-1 US-08-107-75A-1 US-08-107-75A-1 US-08-99-416-191 US-08-99-873-273-4 US-08-99-273-4 US-08-998-416-191 US-

SYNTHESI

LIBRARY: lambda gt10

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-08-622-166A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-08-622-166A-3
                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 1, Application US/08622166A Patent No. 5952545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 1.3%;
Best Local Similarity 53.1%;
Matches 225; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
                          COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30 (EPO)
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                         APPLICANT: SZEKERES, MIKLOS
APPLICANT: ALTMANN, THOMAS
TITLE OF INVENTION: NUCLEIC ACID MOLECULES ENCODING CYTOCHROME
TITLE OF INVENTION: P450-TYPE PROTEINS INVOLVED IN THE BRASSINOSTEROID SYNTHESIS
                                                                                                                                                                                                                                                                                                                                                       APPLICANT: KONCZ, CSABA
APPLICANT: MATHUR, JAIDEP
APPLICANT: SZEKERES, MIKLO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1162 CCGGTACGGTTCGGTTTTCATGACGCATCTTTTTGGTGAACCGACGATTTTCTCAGCTGA 1221
                                                                                                                                                        STREET: P.O. Box 747
CITY: Falls Church
STATE: Virginia
COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1575 AAAA 1578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1222 CCCGGAAACGAACCGGTTTGTTCTTCAGAACGAAGGGAAGCTTTTTTGAGTGTTCTTATCC 1281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3501 caggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatcagctga 3560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3921 ttaa 3924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME/KEY:
LOCATION:
LOCATION:
APPLICATION NUMBER: US/08/622,166A FILING DATE: 27-MAR-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tttctctgctcaagacgaggccaaaaaggtttttatttttatcttttattttgctaaatt 3860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CATGCTTGATATTGACCGGTTAGTCCGGTTTAATCTTGATTCTTGG-----TCTTCTC 1454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 acttaaagatgttgagagacatactttgtttgtttcttgattctttggcaacaaaactctat 3800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TAAACGTATGCACTCTCACCATGAGCTTTGCTAATTCTTCAATCATTAAAGACCATCT 1401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TGCTTCCATTTGTAACCTTTTGGGGAAACACTCTCTGCTTCTTATGAAAGGTTCTTTGCA 1341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTGTTCTCCTCATGGAAGAAGCCAAAAAGGTAACCAAAAAATTCTTGCTTATCAAAAAAC
                                                                                                                                                    22040-0747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS

join(968..1483, 1680..1829, 1917..2165, 3903

..3989, 4084..4162, 4248..4354, 4446..4576, 4674

..4773)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 92.8; DB 2;
Pred. No. 2.1e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 192;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 4937;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7;
```

```
RESULT 3
US-08-487-826B-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                 Sequence 13, Application US/08487826B Patent No. 5993827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 1.3
Best Local Similarity 56.6
Matches 162; Conservative
                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEFAX: (703) 205-8050
TELEX: 248345
INFORMATION FOR SEQ ID NO: 1:
                                                                                      APPLICANT: Sim, Kim L.
APPLICANT: Chitnis, Chetan
APPLICANT: Miller, Louis H.
APPLICANT: Miller, Louis H.
APPLICANT: Peterson, David S.
APPLICANT: Valens, Thomas E.
APPLICANT: Wellems, Thomas E.
APPLICANT: Wellems, Thomas E.
APPLICANT: Wellems, SINDING DOMAINS FROM PLASMODIUM VIVAX
TITLE OF INVENTION: AND PLASMODIUM FALCIPARUM ERYTHROCYTE BINDING PROTEINS
NUMBER OF SEQUENCES: 45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY: linear MOLECULE TYPE: CDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE/DOCKET NUMBER: 30,330
REFERENCE/DOCKET NUMBER: 0147-0153P
TELECOMMUNICATION INFORMATION:
TELEPHNONE: (703) 205-8000
TELEPHNONE: (703) 205-8000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3501 caggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatcagctga 3560
                                                                          NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTORNEY/AGENT INFORMATION:
NAME: SVENSSON, LEONARD R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IMMEDIATE SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HYPOTHETICAL: I
                                                                                                                                                                                                                                                                                                                                                                                                                      482 CATGCTTGATATTGACCGGTTAGTCCGGTTTAATCTTGATTCTTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LIBRARY: la
CLONE: C204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEPHONE: (703) 205-8050
                                     STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: nucleic acid
STRANDEDNESS: double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION:
                                                         ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                             acttaaagatgttgagagacatactttgtttgtttcttgattcttgg 3786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tagaagtataggtgggattctttggggaaatggtcgatgcttgttcttgttggtgacatgca 3680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCCGGAAACGAACCGGTTTGTTCTTCAGAACGAAGGGAAGCTTTTTTGAGTGTTCTTATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGGTACGGTTCGGTTTTCATGACGCATCTTTTTGGTGAACCGACGATTTTCTCAGCTGA 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TAAACGTATGCACTCTCTCACCATGAGCTTTGCTAATTCTTCAATCATTAAAGACCATCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TGCTTCCATTTGTAACCTTTTGGGGAAACACTCTCTGCTTCTTATGAAAGGTTCTTTGCA
SSEE: Knobbe Martens Olson & Bear
7: 620 Newport Center Drive 16th Floor
Newport Beach
California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1608 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lambda gt10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cDNA to mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 87.6; DB 2; Length 16(
Pred. No. 1.6e-08;
0; Mismatches 124; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1608;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
```

0;

```
US-08-487-826B-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEFAX: (619) 235-0176
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOTTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/487,826B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1073
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REGISTRATION NUMBER: 29,655
REFERENCE/DOCKET NUMBER: NIH121.001CP1
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: Israelsen, Ned
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                   1433
                                                                                                                                                                                                                                                                                                                                   1313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1013 ttaaaatacgattttacagcgtcactagttgagattactagcataaagcataaaggaccc 1072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE: CI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ANTI-SENSE:
                                                                                                                                                                                                                                                                                              529
                                                                                                                                                                                                                                                                                                                                                                                                                                              409
                                                                                                                                                                                                                                                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           289
763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1.18;
Local Similarity 42.68;
les 590; Conservation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE: 10-SEP-CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY: UZIP: 92660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LENGTH: 19124 base pairs
                                                                                                                                                                                                                                                                                                                         gtgatgtcgataaatgaaattcacacgcgtggtaataattatgggaccgtatgttacgat 1372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tttaacatatttattgttagttggaatttaataagagcgaacttgtaacattacaatatt 1612
                                                                                                                                                                                                                                                                                                                                                                                          ccatatatgggtatgctatacctttcacgtatgctatactagagactaaagaatagttat 1312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gttcaagctatttatacaaagttacaaactgaatatagcttgaaatcctttagaaaattt
AATAATATAAATACTCGTATTTATAAATTCATTTATATTTCAAATATATTTCGATGGT
                                                                                                                                                                  cgatttttcttggattccattcaatgatctaaaaatgcatagatcttttgggttacagttt 1492
                                                                                                                                                                                                                      TCACTTATTATAAAATGATTTATTACGATTAAAAACATATTGAGATTATAATAATATAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tggaattaccggttgttatgtaaatatatagatttagtggtaaacaaatatgttaatcaatt 1192
                                                                      ATGTCGTTTATATACTTATATAGGTCTTTATAACTATTGATTAATAGAAGGTAATAGCCT
                                                                                           TCTTTTATC - - - - - ACATGTGAAATATTAAAAATAATTTTCGATTTTATCGATATATTT
                                                                                                                                                                                                                                                                                                                                                                                                                                            AATTTCTTAATTCTTTTATGCAAACAAAAAACATAAAGTAATTCTACATATCAACAAAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (619) 235-8550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10-SEP-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 77.4; DB 2;
Pred. No. 2.9e-06;
0; Mismatches 781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 19124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                           1552
                                                                                                                                                                                                                      648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω
```

Qy 밁 Ş 밁 ρ

В

2 망 Q В ρ 밁 Q Db Š

Š 밁 Š 밁

밁

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                     γ
                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QУ
                                                                                                                                                                            US-08-998-416-288
                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                           RESULT
                                                                                                                                   Sequence 288, Application US/08998416 Patent No. 6239264 GENERAL INFORMATION:
                                      APPLICANT:
APPLICANT:
                                                                                                         APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                        1535
                                                                                                                                                                                                                                                                                                                                             1475
                                                                                                                                                                                                                                                                                                                                                                        2273
                                                                                                                                                                                                                                                                                                                                                                                                 1415
                                                                                                                                                                                                                                                                                                                                                                                                                            2213
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1613
            TITLE OF INVENTION:
                                                                              APPLICANT:
                                                                                                                                                                                                                                   1595 TAAAA 1599
                                                                                                                                                                                                                                                              2393
NUMBER OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     catagattaattaccgtatgtttttgttgccataatgacagcctctacaactgtgatagt 1852
                                                                                                                                                                                                                                                            ataaa 2397
                                                                                                                                                                                                                                                                                                                                                           TAATATATTTTTTTCATAATTATATGATTTTAGTATTTTAATAATAATAAATCTTTTAA
                                                                                                                                                                                                                                                                                                                                                                                                                        atagaaaactattttgttgtggaatggaagtagtaatatacattaagcaaattttaaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tttagttataaatacattatgaaccaataatagttggtgaattcaaatatctccattaat 2092
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTGTATTATCATAGTATATATAATGTTGTATAACGCTTCAAAATATATAATAATAATAATAA 1122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tatattagatactagtatgtgattattccaaatacattactttggatgtttaaacttaatc
                                                                                                                                                                                                                                                                                                                                             AAAACTTCAAAACATTTTTGCATAAAATAATAATTAATATTAGTAACCACCTAGATAAATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              atttttgaaatctacaaattattaatatttagtcaataacaatgcatagaaagttccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TATATATTAGTATATGTTATCAAAATATTATAATATGTAAATT----ATTAATAAAATATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tgagtattacattttaaatttaaagacaaaatttttgaaaaatgttataaatttctaacaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgcgatgcatgaaggataaacctaatgactttaattttttgaaaatgtaaccctttttact 1792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTATTTTCAAATACAATTAATTAGATTTCTTAAATATTTCTTCATTTATTCATTTTATA
                                                                                                                                                                                                                                                                                         AGAGAGAAACGTAGAACATACCAAAAAAAATTAGAACAAAAAGAATATTACAAAAAATAA
                                                                                                                                                                                                                                                                                                               ggtgcgattcagaattgggacaacaatgaaaacggaattaaaatattaactttaaaataa
                                                                                                                                                                                                                                                                                                                                                                                                                                                      caattttttctgcaaatattaaattaggaattcaatgctactatcaatagaagaaacagc 1912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTTTCATACATTACATTTTTCACACACAATTTAAGTTGTCATAATGTAACACATTAAAT 1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ttgtttcttcctacggtataaatattaatcatcgaggtaaaaaagttttgtcttatttt 1732
SEQUENCES:
         Wendland, Jurgen
Knechtle, Philipp
Rebischung, Corinne
RVENTION: GENOMIC DNA SEQUENCES OF ASHBYA GOSSYPII
RVENTION: AND USES THEREOF
                                                                                        Philippsen, Peter Pohlmann, Rainer Steiner, Sabine
                                                                              Mohr, Christine
 1152
                                                                                                                         Peter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1972
                                                                                                                                                                                                                                                                                       1594
                                                                                                                                                                                                                                                                                                                                                                                                 1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                      1414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2032
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1672
                                                                                                                                                                                                                                                                                                                  2392
                                                                                                                                                                                                                                                                                                                                             1534
                                                                                                                                                                                                                                                                                                                                                                                                                           2272
                                                                                                                                                                                                                                                                                                                                                                      2332
```

```
US-08-998-416-288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 250; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX: 919-541-8689 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME: Meigs, J. Timothy
REGISTRATION NUMBER: 38,241
REFERENCE/DOCKET NUMBER: PF.
TELECOMMUNICATION INFORMATION:
TELEPHONE: 919-541-8587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MOLECULE TYPE:
ORIGINAL SOURCE:
                               2166 aacagaaacttccaaattttttttttttttatggaacaagaaataacagatagaaaactatt 2225
                                                                                              1990 cctataatgtatttcctatgttcttaaaatattttt----ttttatatttagttataaat 2045
                                                                                                                                                                                                                                                                                                                                     1930 tttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaatatgatg 1989
                                                                                                                                                                                                                                                                                                                                                                                                             1870 attaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacattttaa 1929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1810 atgtttttgttgccataatgacagcctctacaactgtgatagtcaattttttctgcaaat 1869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE CHARACTERISTICS:
LENGTH: 837 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: CH 0016/97
FILING DATE: 31-DEC-1996
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                        116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION DATA:
476 TAACTTTAATTTCTTATTAATTATTTTATATTTTAATAAAATTATATTTCATTTTATT
                                                                                                                                                176 TATATAATTATAAAAATAATATTTAATATGAATACTATTTAGTCTATGTTCAAATTTTAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                    acattatgaaccaataatagttggtgaattcaaatatctccattaatatttttttgaaatc 2105
                                                                                                                                                                                                                                                                                                   ATTAGTTATTAAAATATTATTAGATATTATTATTTTCTTTAATAAATTATTAAATAGATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                    T: 3054 Cornwallis Road
Research Triangle Park
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        No. 6239264th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    919-541-8689
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PAG1241RP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER: US/08/998,416
24-DEC-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6239264artis Corporation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Carolina
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PF/5-30306/A/CGC1976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 68.6; DB 4;
Pred. No. 6.4e-05;
0; Mismatches 279;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 837;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
535
                                                                                                           2165
                                                                          475
                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                            235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲.
```

밁 Š 밁 δÃ В Š 밁 δÃ ₽ Ş ,B ş 뭥 ş 밁

```
Š
                                             B
                                                                        Š
                                                                                                       В
                                                                                                                                    Qy
                                                                                                                                                                   ф
                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                        US-08-487-826B-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-08-487-826B-13/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 13, Application US/08487826B Patent No. 5993827
                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEFAX: (619) 235-0176 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                    MOLECULE TYPE:
HYPOTHETICAL: N
ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE/DOCKET NUMBER: NI
TELECOMMUNICATION INFORMATION:
TELEPHONE: (619) 235-8550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                             SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Israelsen, Ned
REGISTRATION NUMBER: 29,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION DATA: APPLICATION NUMBER: US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                       TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2226 ttgttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattata
600 aagagtattgagaaaaaccgaa---aataagaaaagggaaagagtagtgacccatggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STREET: 620 Newport Center Drive 16th Floor CITY: Newport Beach STATE: California
                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                               STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                  cgtttatcgatcactccaatcatgattatgattcttgtgctaatccagcaaattattaac 599
                                                                                                                       ccaattaaaatttcgaattcatatctcttgattattaaattaaatacgagtgtgaatatc 539
                                                                                                                                                                                      taggtttatttgatcataattacatgcatcatttctttgattactatgaagattttctta 479
                                                                                                                                                                                                                               821;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   92660
                                                                                                                                                                                                                                                                                                                                                                                           nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Chitnis, Cheta
Miller, Louis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Su, Xin-zhaun
Wellems, Thoma
                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Miller, Louis H. Peterson, David S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sim, Kim L.
                                                                                                                                                                                                                                                                                                                                                                  linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Knobbe Martens Olson & Bear
                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10-SEP-1993
                                                                                                                                                                                                                                                                                                                                                    CDNA
                                                                                                                                                                                                                                                                                                                                                                             single
                                                                                                                                                                                                                                         1.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BINDING DOMAINS FROM PLASMODIUM VIVAX AND PLASMODIUM FALCIPARUM ERYTHROCYTE BINDING PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Thomas E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Chetan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/08/487,826B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29,655
                                                                                                                                                                                                                                                                                                                                                                                                                                            13:
                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                         Score 67.4;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NIH121.001CP1
                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                            4; DB 2;
0.00025;
                                                                                                                                                                                                                              1091;
                                                                                                                                                                                                                                                          Length 19124;
                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                               29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2278
                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                              7
```

멍

Qy

04 07 07 09 09

```
5787
                                                                                                                                                                                                                             5967
                                                                                                                                                                                                                                                                                                                                              1436
                                                                                                                                                                                                                                                                                                                                                                                   6087
                                                                                                                                                                                                                                                                                                                                                                                                                     1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                            6147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        777
                         tgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttgtcttattttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 atatgggtatgctatacctttcac-gtatgctatactagagactaaagaatagttatgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gtcaacatatacataattccttacagaaaaaacaaacttaagagaagttaacatatccat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                attaccggttgttatgtaaatatagatttagtggtaaacaaatatgttaatcaattagtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ctcttaactatattatcgcggatatatgataacaatgatatatcacaaaacaattgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aaaatttgcgataacgattgtgaaaaatattttatttgttagctgatctcaatattatgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAAAATACGAAAATACAAAACATATAAAAAAAGTATATATGCAACGTGTTTATATATTTAAT
atattagatactagtatgtgattattccaaaatacatactttggatgtttaaacttaatct
                                                                                                                                                  ttaacatatttattgttagttggaatttaataagagcgaacttgtaacattacaatattt
                                                                                                                                                                                                                                                                                                    TTTATATTTGTTATATTATAATAACAAAAAAAGAACGACAAGAAGTAAAAACAAAAAAATT
                                                                                                                                                                                                                                                                                                                                        ttttcttggattccattcaatgatctaaaatgcatagatcttttgggttacagtttcga
                                                                                                                                                                                                                                                                                                                                                                                                       atgtcgataaatgaaattcacacgcgtggtaataattatgggaccgtatgttacgatcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTCATGTTCTATATATTATATAAATGAAAATATTTGTTATAATATAAATACATATATGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAATAAGTAAAAATACACATTATAAATATATATTCAAATATGAGTTATTAATAAAATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TATTTTTTTATGTATTTCATGCATTTTATGAATTTCAAAATTTTATTGTATAATATAAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aagctatttatacaaagttacaaactgaatatagcttgaaatcctttagaaaattttgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATTATTATATTATATTATATTATATTAATAAAAATGTTTTTATCATT---TGTTTTGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aatacgattttacagcgtcactagttgagattactagcataaagcataaaggacccgttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgggaccattttgaataaactttttctcaaacattacgggacactggactcgacccttaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATCATATTTATATATCATATATATATATATTGATATAGATACATATTCTTTGTATTGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTATATATATATTATTTTTTTTTTATGTTTATTTAAGTAAAATTATAAATGAGAAAAA
                                                                         ATAATAATAAAGGATGATATAATAAAACTAATTACCTATTAGTATAGTTTTAATGTCTT
                                                                                                                                                                                                                                                               agtcctctacaagcgtgtaaccatctg--caactattaaattgctttctttaatgcatct
                                                                                                                                                                                                                                                                                                                                                                               TACTATATAATAATAATAATATCTTTAAAGTATATACTAAAAATATATAAAAAATGCATGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tatgtgaataattatcaaagagaataagagatgacaaccaaaaggttgtggaataatggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1076
                                                                                                                                                                                                                                                                 1553
                                                                                                                                                                                                                                                                                                                                                                                                                     1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                          6088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6745
5728
                                   1733
                                                                         5788
                                                                                                            1673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    956
                                                                                                                                                                                                                           5908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6505
                                                                                                                                                                                       1613
```

```
밁
                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                            멍
                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                        US-08-998-416-186
                                                                                                                                            δõ
                                                                                                                                                                         밁
                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                    뮰
                                                                        RESULT
                                                                                                                   밁
                           Sequence 186, Application US/08998416 Patent No. 6239264
            GENERAL INFORMATION:
                                                                                                                   5141
                                                                                                                                                                                                                                    5261
                                                                                                                                                                                                                                                                                                                                                                                                              5441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1854
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1734
                                                                                                                                                                                                                                                                                                                                                    5381
                                                                                                                                                                                                                                                                                                                                                                                 2091
                                                                                                                                                                                                                                                                                                                                                                                                                                         2034
 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gagtattacattttaaatttaaagacaaaatttttgaaaaaatgttataatttctaacaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aattttttctgcaaatattaaattaggàattcaatgctactatcaatagaagaaacagct 1913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gcgatgcatgaaggataaacctaatgactttaatttttttgaaaatgtaacccttttactc
                                                                                                                   AAAAAACACAAAATCGAAATT
                                                                                                                                                                     ARTTATTATTATATAGAACGCATTCACATATAAATAATTAGTCCATAATATTCATCA
                                                                                                                                                                                                                                                   aacagatagaaaactattttgttgtggaatggaagtagtaatatacattaagcaaatttt
                                                                                                                                                                                                                                                                                                                                                                                                                             ttagttataaatacattatgaaccaataatagttggtgaattcaaatatctccatta---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---TATTTAAATATTTTTCAAAAAACTAATCATGTTAATATAATATAATATAACATAAAT
                                                                                                                                           tgcatggtgcgattcagaatt
                                                                                                                                                                                                   TAAGCTATTGGAACTACAAAATCAGGATATTTATTTCTTATTTTTCATTTTTTAAATAA
                                                                                                                                                                                                                                                                                            GACTTATTATTCAGTATTCTTATTTTATTTTTTTTTTCCTTATTTAAGATTAAAATAA
                                                                                                                                                                                                                                                                                                                                                                              ---atatttttgaaatctacaaattattaatatttagtcaataacaatgcatagaaagt
                                                                                                                                                                                                                                                                                                                                                                                                             TTTCTATAATACATGTTACGTATTTGTAATTATGTTACATTTTTAAAAAATGTATAATAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TATTTTGTATGAAATACTATTATTTAACTAATTTATTATTATTATGA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             atagattaattaccgtatgtttttgttgccataatgacagcctctacaactgtgatagtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TCTATTCA-CATATAAATATATAATGAACAACCCATATATACTTATAGCCTTATATACAC
Philippsen, Peter
                                                                                                                   5121
                                                                                                                                              2348
                                                                                                                                                                           5142
                                                                                                                                                                                                      2327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1973
                                                                                                                                                                                                                                                                                                                                                                                                              5382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2033
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5669
```

US-08-998-416-186

US-08-998-416-186

Sequence 186, Application US/08998416

Patent No. 6239264

GENERAL INFORMATION:
APPLICANT: Philippsen, Peter
APPLICANT: Steiner, Sabine
APPLICANT: Steiner, Sabine
APPLICANT: Mendland, Jurgen
APPLICANT: Knechtle, Philipp
APPLICANT: Rebischung, Corinne
TITLE OF INVENTION: GENOMIC DNA SEQUENCES OF
TITLE OF INVENTION: AND USES THEREOF
NUMBER OF SEQUENCES: 1152
CORRESPONDENCE ADDRESS:
ADDRESSEE: No. 6239264artis Corporation
STREET: 3054 Cornwallis Road
CITY: Research Triangle Park
STATE: No. 6239264th Carolina
COUNTRY: USA
ZIP: 27709
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC Compatible
COMPUTER: IBM PC Compatible
COMPUTER: Patentin Release #1.0, Version #1

ASHBYA GOSSYPII

밁

gg dg

P So

B & B &

δÃ

밁 Š В Qy 밁 Qy 밁 δÃ 멍 Q В γQ 밁 Qy 밁 Q . 문 δ 뮻

Knechtle, Philipp

```
US-08-998-416-1137; Sequence 1137, Application US/08998416; Patent No. 6239264
                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                           . 뭐
                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                            В
                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; ORGANISM:
US-08-998-416-186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 216; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX: 919-541-8689
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1930
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MOLECULE TYPE:
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION DATA:
APPLICATION NUMBER: CH 0016/97
FILING DATE: 31-DEC-1996
                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE CHARACTERISTICS:
LENGTH: 615 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELECOMMUNICATION INFORMATION: TELEPHONE: 919-541-8587
                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTORNEY/AGENT INFORMATION:
 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION DATA:
                                                                                                                                                                                                                 416
                                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS:
TOPOLOGY: lin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME: Meigs, J. Timothy REGISTRATION NUMBER: 38 REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: FILING DATE: 24-DEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION:
                                                                                                                                                                             aacagaaacttccaaatttttttttt 2192
                                                                                                                                                                                                                                                                                                                                                                                       tttaaagacaaaatttttgaaaaatgttataatttctaacaatattattattaaaatatgatg 1989
                                                                                                                                                           AACTTTAATTTCTTATTAATTTTT 502
                                                                                                                                                                                                                                                                                 acattatgaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatc 2105
                                                                                                                                                                                                                                                                                                                                             cctataatgtatttcctatgttcttaaaatattttt----ttttatatttagttataaat 2045
                                                                                                                                                                                                                                                                                                                                                                                                                          TATATAATTATAAAAATAATATTAATATGAATACTATTTAGTCTATGTTCAAATTTTAA 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                 attaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacattttaa 1929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              atgtttttgttgccataatgacagcctctacaactgtgatagtcaattttttctgcaaat 1869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTAGTTATTAAAATATTATTAGATATTATTTATTTCTTTAATAAATTATTAAATAGATT 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
Wendland, Jurgen
                        Pohlmann, Rainer
Steiner, Sabine
                                                  Philippsen, Peter
               Mohr, Christine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PAG1074RP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-DEC-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US/08/998,416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 38,241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PF/5-30306/A/CGC1976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 65.8; DB 4;
Pred. No. 0.00021;
0; Mismatches 227;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             175
                                                                                                                                                                                                               475
                                                                                                                                                                                                                                                                  415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ۲,
                                                                                                                  Qy
                                                                                                                                                                                                В
                                                                                                                                                                                                                         Qy
                                                                                          밁
                                                                                                                                             밁
                                                                                                                                                                     Q
                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                             209
                                                                                                                                                                                                                                                                                                       29
```

```
); ORGANISM:
US-08-998-416-1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match 0.9%;
Best Local Similarity 47.1%;
Matches 269; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEFAX: 919-541-8689
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE: 31-DEC-1996
ATTORNEY/AGENT INFORMATION:
NAME: Meigs, J. Timothy
REGISTRATION NUMBER: 38,
REFERENCE/DOCKET NUMBER:
2200 caagaaataacagatagaaaactattttgttgtggaatggaagtagtaatatacattaag
                                                                                                                                                                                                                                                                                                                                                                                      1901 agaagaaacagctgagtattacattttaattttaaagacaaaattttttgaaaaatgttata 1960
                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOLECULE TYPE:
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE CHARACTERISTICS:
LENGTH: 636 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILING DATE: 24-DEC-1
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOFTWARE, CATTON DATA:
CURRENT APPLICATION DATA:
CURRENT APPLICATION NUMBER: US/08/998,416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Rebischung, Corinne
TITLE OF INVENTION: GENOMIC DNA SEQUENCES OF ASHBYA GOSSYPII
TITLE OF INVENTION: AND USES THEREOF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREET: 3054 COLUMNATE PARK CITY: Research Triangle Park STATE: No. 6239264th Carolina
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE: y15 TD NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADDRESSEE:
                                                                                  tatctccattaatatttttttgaaatctacaaattattaatatttagtcaataacaatgca
                                                                                                                                                                                                                                    atttttttttatatttagttataaatacattatgaaccaataatagttggtgaattcaaa 2079
                                                         atttctaacaatattattaa-aatatgatgcctataatgtatttcctatgttcttaaaat 2019
                                                                                                                                                                                                                                                                                                                                                              AAGATTAATATAAACTTTTTTATTATAATATTTAAGTATTAAATTATTTAAACTATTATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            27709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               E: No. 6239264artis Corporation
3054 Cornwallis Road
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PAG1692RP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   919-541-8587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24-DEC-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CH 0016/97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1137:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 65.4; DB 4;
Pred. No. 0.00025;
0; Mismatches 296;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PF/5-30306/A/CGC1976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 636;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                         383
```

```
ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                δõ
                                                  밁
                                                                                                             밁
                                                                                                                                            QΥ
                                                                                                                                                                                                                                                         ; TOPOLOGY: linear; MOLECULE TYPE: genomic US-08-446-855A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 8
US-08-446-855A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 1, Application US/08446855A Patent No. 5849573
                                                                                                                                                                            Best Local Similarity Matches 278; Conserv
                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                    TELEFAX: 703-816-4100
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE/DOCKET NUMBER: 47
TELECOMMUNICATION INFORMATION:
TELEPHONE: 703-816-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Stewart, Thomas S
APPLICANT: Flores, Maria V
APPLICANT: O'Sullivan, William J
                                                                                                                                1874 aattaggaattcaatgctactatcaatagaagaaacagctgagtattacattttaattta 1933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: PatentIn Release #1.24
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS
               1993 ataatgtatttcctatgttcttaaaatatttttttttatatttagttataaatacattat 2052
                                                                             1934 aagacaaaatttttgaaaaatgttata-atttctaacaatattattaaaatatgatgcct 1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATTORNEY/AGENT INFORMATION: NAME: Mitchard, Leonard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: Nucleotide sequence encoding carbamoyl TITLE OF INVENTION: phosphate synthetase II
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 564 TAATTAATATTTATCATTATTTAATTAATT 594
                                                212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STATE: V
                                                                                                                                                                                                                                                                                                       LENGTH: 8920 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: FILING DATE: 06-Ju
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CITY: Arlington
                                                                                                                                                                                                                                                                                                                                                                                                                                                     REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aactttaaaataaattaaaatttgagtaaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   attaataatgcatggtgcgattcagaattgggacaacaatgaaaacggaattaaaatatt 2379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caaattitaaaaaattatataagcctatacgcgctcaaagtatgttatctagtaggtgta 2319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22201-4714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Virginia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  E: Nixon & Vanderhye PC
1100 No. 5849573th Glebe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      USA
                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 06-Jul-1995
                                                                                                                                                                                       0.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/08/446,855A
                                                                                                                                                                                                                                                                                                                                                                                                                                                   29.009
0,
                                                                                                                                                                                                                                                                                                                                                                                                                                       47-80
                                                                                                                                                                          Score 63.6; DB 2;
Pred. No. 0.0011;
0; Mismatches 304;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Road, 8th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2410
                                                                                                                                                                            304;
                                                                                                                                                                                                        Length 8920;
                                                                                                                                                                            Indels
12;
                                                                                                             211
                                                271
                                                                                                                                                                            2
```

QΥ

1993 ataatgtatttcctatgttcttaaaatattttttttttatatttagttataaatacattat 2052

밁

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
В
                                                         밁
                                                                                 δÃ
                                                                                                                                                                                    ; LENGTH: 8920
; TYPE: DNA
; ORGANISM: Plasmodium falciparum
US-09-150-741-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-150-741-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/150,741
CURRENT FILING DATE: 1998-09-10
EARLIER APPLICATION NUMBER: PL6380
EARLIER FILING DATE: 1992-12-16
EARLIER APPLICATION NUMBER: AU93/00617
EARLIER APPLICATION NUMBER: 08/446,855
EARLIER APPLICATION NUMBER: 08/446,855
EARLIER FILING DATE: 1995-07-06
EARLIER FILING DATE: 1995-07-06
                                                                                                                                                                                                                                            NUMBER OF SEQ ID NO
SOFTWARE: PatentIn
SEQ ID NO 1
                                                                                                             Query Match
Best Local Similarity 46.1
Matches 278; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 1, Application US/09150741 Patent No. 6183996
                                                                                                                                                                                                                                                                                                                                                                                                                                 Patent No. 6183996
                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                         FILE REFERENCE:
                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE OF INVENTION: Synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                            1934
                                                                     1874 aattaggaattcaatgctactatcaatagaagaaacagctgagtattacattttaattta 1933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  452
                                                      572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            272
 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TATTAATATATTTCCAATTAATATGAATACAATTATTAATATTTTGATGTGTACACATTA 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TATATATATATATATGTTTTGTGTGTTCATTTGTTTATAAAATTACTTGAAAATATAAAAACT 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatctacaaat 2112
               acttccaaatttttttttttttatgga-----
AAAAAAAAAAAAAAGAAAAAAAAAAATTTACATATGAAAAATGAACTTGTATATGTAAA 691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tattttgttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattatataa 2281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Stewart et al
                                                                                                                                                                                                                                                                       ID NOS: 15
                                                                                                                                                                                                                                                           Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                Nucleotide Sequence Encoding Carbamoyl Phosphate
                                                                                                                         0.9%;
                                                                                                               0,
                                                                                                                           Score 63.6; DB 4; Length 8920; Pred. No. 0.0011;
                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -acaagaaataacagatagaaaac 2221
                                                                                                             304;
                                                                                                               Indels
                                                                                                               12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2455
                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  511
                                                                                                               Ŋ
```

```
RESULT 10
US-08-817-926-27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 27, Application US/08817926 Patent No. 6001590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Iwamatsu, Akihiro
APPLICANT: Kato, No. 6001590uo
APPLICANT: Sakai, Yasuyoshi
TITLE OF INVENTION: PROMOTER/TERMINATOR FOR CANDIDA BOIDINII
TITLE OF INVENTION: FORMATE DEHYDROGENASE GENE
NUMBER OF SEQUENCES: 51
                                                                                                                                                                                                                                             COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
                                                                                                                                    APPLICATION NUMBER: PCT/JP96/02597
FILING DATE: 12-SEP-1996
PRIOR APPLICATION DATA:
                                                                                                                                                                                   APPLICATION NUMBER: US/01
FILING DATE: 09-MAY-1997
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                              ATTORNEY/AGENT INFORMATION:
                                                                                          PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             512
                   NAME: Bent, Stephen A. REGISTRATION NUMBER: 2
                                                               APPLICATION NUMBER: JP 42536/1996 FILING DATE: 29-FEB-1996
                                                                                                            FILING DATE:
                                                                                                                          APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                             COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                        STREET: 3000 K STREET: Washington
   REFERENCE/DOCKET
                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatctacaaat 2112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aaaaaaaaaaaaagaaaaaaaaaatttacatatgaaaaatgaacttgtatatgtaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acttccaaattttttttttttatgga-----acaagaaataacagatagaaaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tattttgttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattatataa 2281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tatatatatatatatgtttgtgtgttcatttgtttataaaattacttgaaatataaaact 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tattaatatattccaattaatatgaatacaattattaatattttgatgtgtacacatta
                                                                                                                                                                                                                                                                                                                                                20007-5109
                                                                                                                                                                                                                                                                                                                                                                              D.C
                                                                                                                                                                                                                                                                                                                                                                                                            3000 K Street, N.W.,
                                                                                                                                                                                                                                                                                                                                                                  USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Tamai, Yukio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Suda, Hisako
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Komeda, Toshihiro
                                                                                                                                                                                                                                                                                                                                                                                                                            Foley & Lardner
                                                                                                            12-SEP-1995
   BER: 29,768
NUMBER: 08
                                                                                                                          JP 234133/1995
                                                                                                                                                                                                                                       US/08/817,926
081356/0112
                                                                                                                                                                                                                                                                                                                                                                                                             Suite 500
                                                                                                                                                                                                                                                                     #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2221
```

```
TELEX: (***:
TELEX: 904136
TELEX: 904136
TELEX: 904136
TOR SEQ ID NO: 27:
SEQUENCE CHARACTERISTICS:
LENGTH: 4818 base pairs
TYPE: nucleic acid
TYPE: nucleic double
                                                                                                                                         Д
                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-817-926-27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 0.9%;
Best Local Similarity 44.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE: 1
ORIGINAL SOURCE:
ORGANISM: Can
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2122 ttagtcaataacaatgcatagaaagttccaaaaaaattttgttaacagaaacttccaaa 2181
                                                                                                                                                                                                            1585 aagagcgaacttgtaacattacaatatttatattagatactagtatgtgattattccaaa 1644
                                                                                                                                                                                                                                                                               2002 ttcctatgttcttaaaatattttttttttatatttagttataaatacattatgaaccaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4080 TTGAATTTCATTGATTATTTATATTTCTTAGATTTTTAAAAAAATATTTTCCTCTT-TTTT 4138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE: (202)672-5300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEPHONE: (202, - 2399)
                              gtagtaatatacattaagcaaattttaaaaaattatataag 2282
                                                                                                                                                                                                                                         atagttggtgaattcaaatatctccattaatattttttgaaatctacaaattattaatat
TAACTAAGTCAAAGTCTAATAAATTTCTATTTTTTTTAAG 4779
                                                                                                                                                                                                                                                                                                                                                                                                                       CTTTTGTTGTTTATTCTTGTTTTAATTTTTTTTTTTGTATCAATCTTTAAATTTAGTTTTAA 4438
                                                                                                                                                                                                                                                                                                                                                                                                                                                    attcaatgctactatcaatagaagaaacagctgagtattacattttaatttaaagacaaa 1941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccataatgacagcctctacaactgtgatagtcaattttttctgcaaatattaaattagga 1881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgaggtaaaaaaagttttgtcttattttcgcgatgcatgaaggataaacctaatgacttt 1764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tacatactttggatgtttaaactttaatcttgtttcttcctacggtataaatattaatcat 1704
                                                                    tttttttttttttatggaacaagaaataacagatagaaaactattttgttgtggaatggaa
                                                                                                                                       TTATTATCGAAAAAAACCTTAAAAAAGGACTTCGTAAATTTTATTGTAATAAACGCAAAAA
                                                                                                                                                                                                                                                                                                                                                  atttttgaaaaatgttataatttctaacaatattattaaaaatatgatgcctataatgtat 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aattttttgaaaatgtaacccttttact---catagattaattaccgtatgtttttgttg 1821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATTATTATTATTACTGTCAAACGTTTAAAAAGAAGTAGTATTAAACTTAACCTCTT 4258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           338;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Candida boidinii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       27:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 62.6; DB 3
Pred No. 0.0015;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches 419;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 4818;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
```

2121

2061

4.

Ņ

```
밁
                                                                                                                                                                                               Qy
                                                                                                 В
                                                                                                                              Qy
                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                             Qy
Š
                                밁
                                                             οy
                                                                                                                                                                                                                                                                                                                                                                US-08-232-463-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-232-463-14/c
                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 26; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 14, Appl
Patent No. 567036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
APPLICANT:
                                                                                                                                                                  1426
                                                                                                                                                                                            4160 tgtagtcacgagcaacgatattgaagttcattgagaggaaaatggaagagagaaaattgg 4219
                                                                                                                                                                                                                                                 4100 actctcattataggttttttaatttttattttatgtgttaaataaaatatctaaaatggttg 4159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 300
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703)836-9300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: PatentIn Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                            1486 ACTGTAATTACCTATCTATGCAAGTAGTTAAAGAGAATAGAAGAATTTGGTACRRRRRRR 1427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILING DATE:
APPLICATION NUMBER: EP 91 114 300.6
FILING DATE: 26-AUG-1991
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                        TOPOLOGY: line
IMMEDIATE SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPLICANT: FALKNER, F. G.
ITLE OF INVENTION: RECOMBINANT FOWLPOX VIRUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NAME: BENT, Stephen A. REGISTRATION NUMBER: 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CITY: Alexandria
                                                                                                                                                                                                                                                                                                                                                                                                                                               STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ENGTH:
aacattcgaatttatcgacggagcaaa 4366
                                atatcaaggaagaagatcaagaagaagaagtgaaaacagaggatgaagcagagatga 4279
                                                                                                                                                               gtaagagtgatcatgttaggaaacaaagaacagacgatgatcttttgggatgggttttga 4339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22313-0299
                                                                                                                                                                                                                                                                                                                                                                                                                                                           nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BENT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               899149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Application US/08232463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3: Foley & Lardner
1800 Diagonal Road, Suite 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7218 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DORNER, F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (703)683-4109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SCHEIFLINGER,
                                                                                                                                                                                                                                                                                             Conservative 151; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                USA
                                                                                                                                                                                                                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                             single
                                                                                                                                                                                                                                                                                                             0.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/08/232,463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US/07/935,313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'пј
•
                                                                                                                                                                                                                                                                                                             Score 62.6; DB 1;
Pred. No. 0.0017;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             30472/114 IMMU
                                                                                                                                                                                                                                                                                             90;
                                                                                                                                                                                                                                                                                                                            Length 7218;
                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                               1367
```

0;

1;

```
Q
                                                                                              Db
                                                                                                                              Qy
                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 12
US-07-867-106-2/c
                                                                                                                                                                                                                                                                                                           ; LOCATION:
US-07-867-106-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 2, Application US/07867106 Patent No. 5389526
                                                                                                                                                                                                                                        Query Match
Best Local Similarity
                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEFAX: 215-568-3439
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Chang, And APPLICANT: Williams, I TITLE OF INVENTION: IT TITLE OF INVENTION: S. NUMBER OF SEQUENCES:
                                                               1887
                                                                                                                                                              5787
                                                                                                                                                                               1767 ttttttgaaaatgtaacccttttactcatagattaattaccgtatgtttttgttgccata 1826
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CURRENT APPLICATION DATA:
APPLICATION NUMBER: US
                               1827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/DOCKET NUMBER: RITELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: AU P. APPLICATION NUMBER: PCT// FILING DATE: 02-NOV-1989 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Slade,
1947 tgaaaaatgttataatttctaacaatattattaaaaatatgatgcctataatgtatttcct 2006
                                                                                                                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                         ANTI-SENSE:
                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEPHONE: 215-50.
TELEPHONE: 215-568-3439
THEFAX: 215-568-3439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME: Feeney, Joanne Longo
REGISTRATION NUMBER: 35,134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                        LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY:
                                                                                                                                                                                                                                                                                                                                           NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                         NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                         TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE: PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE: Woodcock Washburn Kurtz Mackiewicz & No. 5389526ris
STREET: One Liberty Place 46th Floor
                                                            atgctactatcaatagaagaaacagctgagtattacattttaatttaaagacaaaatttt 1946
                                                                                                                          atgacagcctctacaactgtgatagtcaattttttctgcaaatattaaattaggaattca 1886
                                                                                                                                                              209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               19103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUCLEIC ACID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5852 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               USA
                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                         linear
                                                                                                                                                                                                                                                                                                                                                                      CDS
2378..5038
                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                          2378..5038
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      215-568-3100
                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19920625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Martin B
, Andy C M
ams, Keith L
                                                                                                                                                                                                                                          0.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Improved Plasmid Vectors for Cellular Slime Moulds of the Genus Dictyostelium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AU PJ 7187
PCT/AU90/00530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/07/867,106
                                                                                                                                                                                                                          Score 61.8; Di
Pred. No. 0.00
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RICE-0002
                                                                                                                                                                                                             0.0022;
217;
                                                                                                                                                                                                                                                         Length 5852;
                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                          7;
                                                                                                                                                                                                                          Gaps
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ġ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 13
US-08-817-926-27/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 27, App. No. 600159
                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: Bent, Stephen A.
REGISTRATION NUMBER: 29,768
                                                                                                                             REFERENCE/DOCKET NUMBER: 08
TELECOMMUNICATION INFORMATION:
TELEPHONE: (202)672-5300
                                                                                                                                                                                                                           FILING DATE: 12-SEP-1995
PRIOR APPLICATION DATA:
APPLICATION NUMBER: JP 42
FILING DATE: 29-FEB-1996
                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION DATA:
APPLICATION NUMBER: PCT/JP96/02597
FILING DATE: 12-SEP-1996
                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
ODERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5487
                                                                SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                            CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: FILING DATE: 09-MAN
                                                                                                            TELEFAX:
                                                                                                                                                                                                                                                                                            APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADDRESSEE:
                                             LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        atttagtcaataacaatgcatagaaagttccaaaaaaattttgttaacagaaacttcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAATTAGTGATCT 5355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aatttttttttt 2192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         taatagttggtgaattcaaatatctccattaatattttttgaaatctacaaattattaat 2119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TAATTATCTATATATCTTGATGAACTTCAATTTTTATAAATTTTAATATATTTAATTTTAA 5368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAAATTATGTATCGATTTTTATTTTAAAATCATTGACGAGATTAAAAAATCTTAAAACAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  atgttcttaaaatattttttttata-----tttagttataaatacattatgaaccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20007-5109
                         nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Application US/08817926
                                          4818 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E: Foley & Lardner
3000 K Street, N.W., Suite 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Iwamatsu, Akihiro
Kato, No. 6001590uo
Sakai, Yasuyoshi
                                                                                                              (202)672-5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tamai, Yukio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Suda, Hisako
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Komeda, Toshihiro
linear
                                                                                                                                                                                                                                                                                                                                                                                           09-MAY-1997
             double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROMOTER/TERMINATOR FOR CANDIDA BOIDINII FORMATE DEHYDROGENASE GENE
                                                                                                                                                                                                                                                                                                                                                                                                            us/08/817,926
                                                                                                                                                                                                                                              JP 42536/1996
                                                                                                                                                                                                                                                                                             JP 234133/1995
                                                                              27:
                                                                                                                                                              081356/0112
                                                                                                                                                                                                                                                                                                                                                                                                                                          Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5548
```

```
δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                      US-08-998-416-288/c
                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-08-817-926-27
                                                                                                                                                                                                                                                                       Sequence 288, Application US/08998416 Patent No. 6239264 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                         APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                     APPLICANT: Wendland, Jurgen
APPLICANT: Knechtle, Philipp
APPLICANT: Rebischung, Corinne
TITLE OF INVENTION: GENOMIC DNA SEQUENCES OF ASHBYA GOSSYPII
TITLE OF INVENTION: AND USES THEREOF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MOLECULE TYPE: 1
ORIGINAL SOURCE:
ORGANISM: Can
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4718
                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                    4238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4538
                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                        4298 AAAGGTATATTAAATCACTGTTATTACCATTATAACTCAGAAGAGTGTTAAGTTTAATAC
                                                                                                             NUMBER OF SEQUENCES:
                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              174
COUNTRY: UZIP: 27709
                          STREET: 3054 Cornwallis Road
CITY: Research Triangle Park
STATE: No. 6239264th Carolina
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    54 ttotggttattctgttcacatgatttgagtttggttctcaatttggattccaagataatt 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
nes 275; Conserv
                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                       gcaaattattaacaagagtattgagaaaaacccgaaaataagaaaaagggaaaga 640
                                                                                                                                                                                                                                                                                                                                                                                                                                                    gagtgtgaatatccgtttatcgatcactccaatcatgattatgattcttgtgctaatcca 586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gaagattttcttaccaattaaaatttcgaattcatatctcttgattattaaattaaatac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTTTTTTTCACCATAATTAACCAAATACCAAAATGAATAATTGAAAAAAATTTGGAAAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tctggattaggtttatttgatca-----taattacatgcatcatttctttgattactat 466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TGATACAAAAAAATTAAAAACAAGAATAAAACAACAAAAAAACAAGAAATTTTTCTTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAACAATTAATAATTTAAAATTAGAATAATAATAAAAAATTTAAAACTAAATTTAAAGAT 4419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ttatatgtatatgagtaaatcaaaaagagtattgattgaagtgtaaacatatttcgttat 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a-aggaaataatcgattccatttggttggattacacagttaagtttttgtgttttcttttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAATTTACGAAGTCCTTTTTAAGGTTTTTTTCGATAATAATAATAAAAATTAAATAAGGT 4599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTTTTTTTATTTCTTTTATTTTTTTTTTTTTATATATGTCATTTTTGCGTTTATTACAATA 4659
               USA
                                                                                                                                                                                                         Mohr, Christine
                                                                                                                                                                                                                          Pohlmann, Rainer
Steiner, Sabine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                          Philippsen, Peter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Candida boidinii
                                                                              No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA (genomic)
                                                                           6239264artis Corporation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0.98;
                                                                                                             1152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 60.8; DB 3;
Pred. No. 0.0033;
0; Mismatches 312;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         312;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 4818;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              292
                                                                                                                                                                                                                                                                                                                                                                                                                                                    4179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ŋ
```

READABLE FORM:

```
RESULT 15
US-08-446-855A-1/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-998-416-288
                                                                      Sequence 1, Application US/08446855A Patent No. 5849573
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local Sir
Matches 191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 0.9%;
Best Local Similarity 49.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEFAX: 919-541-8689
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 837 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE/DOCKET NUMBER: PF
TELECOMMUNICATION INFORMATION:
TELEPHONE: 919-541-8587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION DATA:
APPLICATION NUMBER: CH 0016/97
FILING DATE: 31-DEC-1996
                                                                                                                                                                                                                                                                                                                                                                         2179
                                                                                                                                                                                                                                                                                                                                                                                                                                            2119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1939 aaaatttttgaaaaatgttataatttctaacaatattattaaaatatgatgcctataatg 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: Meigs, J. Timothy
REGISTRATION NUMBER: 38,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                    2299 gtatgttatctagtaggtgtaattaataa 2327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MOLECULE TYPE:
APPLICANT: Stewart, Thomas S
APPLICANT: Flores, Maria V
APPLICANT: O'Sullivan, William J
TITLE OF INVENTION: Nucleotide sequence encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               488
                                                                                                                                                                                            252 ATATTTTAATAACTAATTTAAAATTTGAA 224
                                                                                                                                                                                                                                                                                                                                      368
                                                                                                                                                                                                                                                                                                                                                                                                          428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRANDEDNESS:
                                                                                                                                                                                                                                                                                     aaatttttttttttatggaacaagaaataacagatagaaaactatttgttgtggaatg 2238
                                                                                                                                                                                                                                                                                                                                                                                                                              GAAATTAAAGTTAAATTAATTTAATAATAATTCTTATAAAAAGATTAAATAATATAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ataatagttggtgaattcaaatatctccattaatattttttgaaatctacaaattattaa 2118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tatttcctatgttcttaaaafattttttttttatattttagttataaafacattatgaacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATATATTAATTATTGATAATCTATTTAATAATTATTAAAGAAAATAATAATATCTAATA
                                                                                                                                                                                                                                                                                                                                      nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PAG1241RP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-DEC-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/08/998,416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38,241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     288:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PF/5-30306/A/CGC1976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 60.6; DB 4
Pred. No. 0.0023;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches 194;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 837;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels . 4;
   carbamoyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             429
                                                                                                                                                                                                                                                                                                                                                                                                          369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     549
                                                                                                                                                                                                                                                                                                                                     313
```

1;

밁 QΥ 망 Ş 밁 Š В δ 밁 Q 밁

Ş

completed: September 29, me: 16641 sec

2001,

11:27:42

```
δÃ
                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; TOPOLOGY: 1; MOLECULE TYPE: US-08-446-855A-1
                             Ş
                                                             Вþ
                                                                                           Ş
                                                                                                                          Βþ
                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 163; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                      8631
8451
                                                                                                                          8571
                                                                                                                                                       2099
                                                                                                                                                                                                                      2039
                                                                                                                                                                                                                                                    1979
                                                                                                                                                                                                                                                                                                           8751 TTTTATTTTTTTATAATTAATTAATTATTAAATTATAAATTATTTGTAAATTGAAA 8692
                                                                                                                                                                                                                                                                                                                                1919 ttacattttaaatttaaagacaaaattttttgaaaaaatgttataatttctaacaatattatt 1978
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE CHARACTERISTICS:
LENGTH: 8920 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: phosphate synthetase NUMBER OF SEQUENCES: 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEPHONE: 703-816-4100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: US/08/446,855A FILING DATE: 06-Jul-1995 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NAME: Mitchard, Leonard C
REGISTRATION NUMBER: 29.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE: PatentIn Release #1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CITY: Arlington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                        aactattttgttgtggaatggaagtagtaatata 2252
                                                                                                                                            tataaatacattatgaaccaataatagttggtgaattcaaatatctccattaatattttt 2098
                                                                                                                                                                                                                                                                    AAATACATAAATAAGTAATGTTAAATCGAATTTA 8418
                                                                                         ttttgttaacagaaacttccaaatttttttttttttatggaacaagaaataacagatagaa 2218
                                                                                                                                                                                       TATAAAAAAATAAATCAATATAAATTAATGATCATATTTAATAAAAACATTTATTAATAT
                                                             TATTATATATTACTATTTATATTATATTATACTTTTCATGTTGTTATGGAAATGAAAGTTAAT 8452
                                                                                                                          22201-4714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Virginia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                E: Nixon & Vanderhye PC
1100 No. 5849573th Glebe
                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3: Floppy u...
IBM PC compatible
rvsqEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                703-816-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    genomic
                                                                                                                                                                                                                                                                                                                                                                                         48.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29.009
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             47-80
                                                                                                                                                                                                                                                                                                                                                                                         Score 60.4; DB 2; Length 8920; Pred. No. 0.0047;
                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Road,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8th Floor
                                                                                                                                                                                                                                                                                                                                                                            171;
                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                            0
                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                          8512
                                                                                                                                                                                       8572
```

•	•		
•			
			·
•			
	·		
	•		
			·.
		•	
			·
	•		•
	•		
4	•		

```
Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Run
                                                                                                                                                               Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Searched
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OM nucleic - nucleic search, using sw model
                                                     000000
                                                                                                                                                    No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on:
                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                    Score
     250
250
250
250
                                                     6888
251
251
251
251
251
251
                                                                                                                                                                                                                                                              100.0
3.00.0
3.00.00.00
                                                                                                                                                   Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-502-426-1
6888
                                                                                                                                                                                                                                                                                                         : /SIDSB/gcgdata/geneseq/geneseqn/NA1980.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1981.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1981.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1982.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1985.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1986.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1987.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1987.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1989.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1989.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1990.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1990.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1993.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1993.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
:/SIDSB/gcgdata/geneseq/geneseqn/NA1995.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N_Geneseq_0601:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           730101 seqs, 313950809 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  September 29, 2001, 07:23:36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version 4.5
Copyright (c) 1993 - 2000 Com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        atgtgggtattatattgttg.....cctagttcaggccaaagctt 6888
                                                                                                                                                                                                                                                            /SIDS8/gcgdata/geneseq/geneseqn/NA1998.DAT:*
/SIDS8/gcgdata/geneseq/geneseqn/NA1999.DAT:*
/SIDS8/gcgdata/geneseq/geneseqn/NA2000.DAT:*
/SIDS8/gcgdata/geneseq/geneseqn/NA2001.DAT:*
                                                                                                                                                   Length DB
     Ħ
   AAA5959
AAF58252
AAF58257
AAF58257
AAF58252
AAF58252
AAF58252
AAF58252
AAF58254
AAF58257
AAF58257
                                                                                                                                                                                        SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11415.188 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (without alignments)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Search time 378.88 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1460202
DNA encoding a cyt
Oligonucleotide D1
Oligonucleotide D1
Oligonucleotide D2
Oligonucleotide D2
Oligonucleotide D2
Oligonucleotide D2
Oligonucleotide D1
Oligonucleotide D2
                                                                                                                                                  Description
     AAA59599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ဂ ဂ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    exon
                                                                                                             exon
                                                                                                                                                                CDS
                                                                                                                                                                                                                           Key
                                                                                                                                                                                                                                                                                                             DNA encoding a cytochrome P450 enzyme designated DWF4.
                                                                                                                                                                                                                                                                                                                                                               AAA59599;
                                                                                                                                                                                                                                                                                                                                                                                      AAA59599 standard; DNA; 6888 BP
                                      intron
                                                                                     intron
                                                                                                                                                                                                                                                                                                                                       14-NOV-2000
                                                                                                                                                                                                                                                                                                                                                                                                              ш
```

Arachidonic acid m	AAC58017	21	20674	0.9	63	5
Carbamoyl-phosphat	AAQ62924	15	8920	0.9	ω.	4
50 kD subunit of S	AAQ24134	11 3	1671	0.9	64.2	ω
DNA sequence encod	AAZ37082	21	1431	0.9	4.	N
Plasmodium falcipa	AAA70151	21	5409	0.9	64.4	-
P.falciparum GBP13	AAQ27886	13	2418	0.9	65	0
Plasmodium falcipa	AAA70152	21	6033	0.9	Ġ	9
Arachidonic acid m	AAC58017	21	20674	0.9	5	œ
D)	AAQ53480	15	2503	0.9	65.4	7
	AAA97037	21	2486	1.0	5	σ
	AAA97037	21	2486	1.0	66	G
Arabidopsis thalia	AAC48714	21	1398	1.0	•	4
Human colon cance	AAA01920	21	875	1.0	67.2	ω
	AAZ98287	21	19124	1.0	•	N
Plasmodium var-7	AAT72882	18	19124	1.0	67.4	_
Sequence e	AAN50530	6	5760	1.0	•	0
	AAQ25273	13	2104	1.0	68.2	9
S	AAN71405	ထ	1864	1.0	68.6	æ
Human colon cancer	AAA01920	21	875	1.0		7
	AAN60472	7	4590	1.0	69.6	σ
cDNA encoding a SC	AAZ29911	20	8310	1.0	•	S
Sequence of ANS-1	AAN71405	8	1864	1.1	73	4
g	AAQ25273	13	2104	1.1	74	ω
7	AA298287	21	19124	1.1	77.4	N
	AAT72882	18	19124	1.1	77.4	_
	AAZ29911	20	8310	1.2	79.4	0
4	AAF58238	22	244	1.2		9
	AAC47986	21	1649	1.3		80
	AAC48157	21	1646	1.3		7
thal	AAT85306	18	1608	1.3		σ
ᡤ	AAF58238	22	244	1.3		5
$\mathbf{-}$	AAT85307	18	4937	1.3	92.8	4
Oligonucleotide D1	35	22	ω	3.6	50.	ω
Oliqonucleotide D2	AAF58262	22	936	3. 6	250.6	N

## ALIGNMENTS

(first entry)

TATA\_signal Arabidopsis sp. DWF4; cytochrome P450 enzyme; brassinosteroid; 22alpha-hydroxylation; plant phenotype; cell elongation; ss. promoter /\*tag= d
3424.3503
3424.3503
504.3828
3504.3828
7\*tag= g
3829.3913
/\*tag= g
3914.4066 /\*tag= a
3060..3125
/\*tag= b
3203..6110
/\*tag= c /note= "con 3203..3423 /product= "DWr4 /note= "contains introns" location/Qualifiers

```
Query Match
Best Local Similarity
Matches 6888; Conserv
                                                                                                                                                                                    The present sequence encodes a DWF4 polypeptide. The polypeptide is a cytochrome P450 enzyme that mediates multiple steps in synthesis of brassinosteroids. Specifically, it mediates multiple 22alpha-hydroxylation steps in brassinosteroid biosynthesis. The DWF4 polynucleotide is used for altering the phenotype of a plant. DWF4 plants display a dramatic reduction in the length of different organs, and this size reduction is attributable to a defect in cell elongation. The DWF4 polynucleotides and polypeptides can be used in diagnostic assays and to generate antibodies, which can be used to produce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      exon
                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                  Claim
                                                                                                                                                                                                                                                                                                   plants,
                                                                                                                                                                                                                                                                                                                                                                                             11-FEB-1999;
11-FEB-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          exon
                                                                                                                                                                              immunogenic
                                                                                                                                                                                                                                                                                                                                                                           (ARIZ-)
                                                                                                                                                                                                                                                                                                                                                                                                                        11-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       intron
   121
                                      61
                                                        61
                                                                                                                                                                                                                                                                                                isolated dwf4 polynucleotide useful for altering nts, for diagnostic assays and in the production o
                                                                         2000-549142/50
                                                                                                                                                                                                                                                                                                                                                                          ARIZONA BOARD
                                                                                                                                                            8889
                                                                                                              100.0%; ilarity 100.0%; Conservative 0
                                                                                                                                                                              compositions.
                                                                                                                                                                                                                                                                                                                                                                                                                        2000WO-US03820
                                                                                                                                                                                                                                                                                 10A-G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           511.

/*tag= q

5865..6110

/*tag= r

6011..6468

**+ag= s
                                                                                                                                                            BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /*tag= m
4816. /
                                                                                                                                                                                                                                                                                                                                                                                            99US-0119657
99US-0119658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4067..4164
/*tag= i
4165..4479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5001..5110
/*tag= p
5111..5864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /*tag= k
4632..4724
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /*tag= j
4480..4631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /*tag=
4725..4
                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /*tag=
4895..!
                                                                                                                                                           2294 A; 1010
                                                                                                                                                                                                                                                                                113pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ..5000
                                                                                                                                                                                                                                                                                                                                                                            OF REGENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                 English.
                                                                                                               <u>,,</u>
                                                                                                              Score 6888;
Pred. No. 0;
); Mismatches
                                                                                                                                                           Ç
                                                                                                                                                            1193
                                                                                                                                                           G;
                                                                                                                                                           2391
                                                                                                                                 ΒB
                                                                                                              0;
                                                                                                                                21;
                                                                                                                                                           Τ;
                                                                                                                                                           0
                                                                                                               Indels
                                                                                                                                Length 6888
                                                                                                                                                                                                                                                                                                  g the phenotype of antibodies
                                                                                                                                                           other;
                                                                                                              0;
                                                                                                              Gaps
                                                        120
                    180
                                                                          60
                                                                                             60
                                                                                                                                                                                                                                                                                                           of.
                                                                                                               0,
                                                                                                    Q
                                                                                                                       Db
                                                                                                                                                                            γQ
                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
           밁
                           δÃ
                                              뫄
                                                              Qγ
                                                                                   B
                                                                                                                                       ρy
                                                                                                                                                           DЪ
                                                                                                                                                                                              В
                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뫄
                                                                                                                        1021
                                                                                                                                         1021
                                                                                                                                                           961
                                                                                                                                                                             961
                                                                                                                                                                                              901
                                                                                                                                                                                                                 901
                                                                                                                                                                                                                                   841
                                                                                                                                                                                                                                                    841
                                                                                                                                                                                                                                                                       781
                                                                                                                                                                                                                                                                                        781
                                                                                                                                                                                                                                                                                                           721
                                                                                                                                                                                                                                                                                                                            721
                                                                                                                                                                                                                                                                                                                                               661
                                                                                                                                                                                                                                                                                                                                                                 661
                                                                                                                                                                                                                                                                                                                                                                                    601
                                                                                                                                                                                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                                                                                                                                                         541
                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccagctttctctcacaatcaatatcgaccctatttggattttctggatattcgttaaaa
                                                                                                                                                                                                                                                                                                                                                                                  atatgagtaaatcaaaaagagtattgattgaagtgtaaacatatttcgttatgaccccca
                                                       ccggttgttatgtaaatatagatttagtggtaaacaaatatgttaatcaattagtggtca
                                                                                                                                cgattttacagcgtcactagttgagattactagcataaagcataaaggacccgttcaagc
                                                                                                                                                          accattttgaataaactttttctcaaacattacgggacactggactcgacccttaaaata
                                                                                                                                                                   accattttgaataaactttttctcaaacattacgggacactggactcgacccttaaaata
                                                                                                                                                                                             gccagctttctctcacaatcaatatcgaccctatttggattttctggatattcgttaaaa
                                                                                                                                                                                                                                                                                                                                                       tgaataattatcaaagagaataagagatgacaaccaaaaggttgtggaataatggtccct
                                                                                                                                                                                                                                                                                                                                                                                                                      gtttatcgatcactccaatcatgattatgattcttgtgctaatccagcaaattattaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                gtttatcgatcactccaatcatgattatgattcttgtgctaatccagcaaattattatca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aggtttatttgatcataattacatgcatcatttctttgattactatgaagattttcttac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aaaaaaaaaaaaaacaaacaaacaaacccccccccgatatagtttttggttctggatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      atatgagtaaatcaaaaagagtattgattgaagtgtaaacatatttcgttatgaccccca
                                                                                            tatttatacaaagttacaaactgaatatagcttgaaatcctttagaaaatttttggaatta
                                                                                                                       cgattttacagcgtcactagttgagattactagcataaagcataaaggacccgttcaagc
                                                                                                                                                                                                                                  tgaataattatcaaagagaataagagatgacaaccaaaaggttgtggaataatggtccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aggtttatttgatcataattacatgcatcatttctttgattactatgaagattttcttac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aaaaaaaaaaaaaacaaacaaaccaaaccccccccgatatagtttttggttctggatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           taatcgattccatttggttggattacacagttaagtttttgtgttttcttttgttatatgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccggttgttatgtaaatatagatttagtggtaaacaaatatgttaatcaattagtggtca
                                                                                   tatttatacaaagttacaaactgaatatagcttgaaatcctttagaaaattttggaatta
                                                                                                                                                                             1020
                                                                                                                       1080
                                                                                                                                                           1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                              960
                                                                                                                                                                                                                 .960
                                                                                                                                                                                                                                   900
                                                                                                                                                                                                                                                    900
                                                                                                                                                                                                                                                                       840
                                                                                                                                                                                                                                                                                        840
                                                                                                                                                                                                                                                                                                                            780
                                                                                                                                                                                                                                                                                                                                               720
                                                                                                                                                                                                                                                                                                                                                                 720
                                                                                                                                                                                                                                                                                                                                                                                   660
                                                                                                                                                                                                                                                                                                                                                                                                     660
                                                                                                                                                                                                                                                                                                                                                                                                                      600
                                                                                                                                                                                                                                                                                                                                                                                                                                         600
                                                                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                          780
```

Ş 밁 ρ В δ

**,** ₽

_	2400	Qy 2341 tcagaattgggacaacaatgaaaacggaattaaaatattaactttaaaataaat	
	2340	Qy 2281 agcctatacgcgctcaaagtatgttatctagtaggtgtaattaat	
	2280	Qy       2221 ctattttgttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattatata	
	2220	Oy 2161 ttgttaacagaaacttccaaattttttttttttttatggaacaagaaataacagatagaaaa	
O II .	2160	Qy 2101 aaatctacaaattattaatatttagtcaataacaatgcatagaaagttccaaaaaaaa	
	2100	Qy 2041 taaatacattatgaaccaataatagttggtgaattcaaatatctccattaatattttttg	
	2040	Qy 1981 aatatgatgcctataatgtatttcctatgttcttaaaatatttttttt	
· ·	1980 1980	Oy       1921 acattttaatttaatataattattaa	
	1920	Qy 1861 totgcaaatattaaattaggaattoaatgctactatoaatagaagaaacagctgagtatt	
	1860	Qy 1801 aattaccgtatgtttttgttgccataatgacagcctctacaactgtgatagtcaattttt 	
	1800	Qy 1741 atgaaggataaacctaatgactttaatttttttgaaaatgtaacccttttactcatagatt	
O H 6	: 1740 : 1740	Qy 1681 tcctacggtataaatattaatcatcgaggtaaaaaaagttttgtcttattttcgcgatgc	
	1680	Oy 1621 atactagtatgtgattattccaaatacatactttggatgtttaaacttaatcttgtttct 	
	1620 1620	Qy. 1561 atttattgttagttggaatttaataagagcgaacttgtaacattacaatatttatattag 	
O U X	1560 1560	Qy 1501 totacaagogtgtaaccatotgcaactattaaattgctttotttaatgcatotttaacat	
	1500	Qy 1441 cttggattccattcaatgatctaaaatgcatagatcttttgggttacagtttcgaagtcc 	
) U (	1440	Qy 1381 atatcattcttggttggtcaacaataaaaacaaaaacaagaaaaaaagaaaacgattttt	
	1380	Qy 1321 gataaatgaaattcacacgcgtggtaataattatgggaccgtatgttacgatcactgcaa	
	1320	Qy 1261 gggtatgctatacctttcacgtatgctatactagagactaaagaatagttatgtgatgtc	

												•						
Qy	Qу Дъ	Qу Дъ	ру	Qу Db	Qу Db	Дy	g Qy	ф	ру	рь	Qy Db	dd Qy	ОУ	Qy Db	99	Db Qy	Db Db	Db
3421	3361 3361	3301 3301	3241 3241	3181 3181	3121 3121	3061 3061	3001 3001	2941 2941	2881 2881	2821 2821	2761 2761	2701 2701	2641 2641	2581 2581	2521 2521	2461 2461	2401 2401	2341
caagtaaacaacaacatcttocaaaaactcaaaaaataaatcctotgtttttgaaattt 3 	cggttatcttaaaccgtacaccgccacaacactcggtgacttcatgcaacaacatgtctc 3	aaaaaccagattcaatctacctccgggtaaatccggttggccatttcttggtgaaaccat 3 	tetteteceategettttgtetettettettettgattetettgatagaagaagaaatag 3	gagagagagagaaactagctccatgttcgaaacagagcatcatactctcttacctcttct 3 	tcagtagaagtccgattcccaatcttaaagacaaagccattagaaagagaaagtgagtg	ataacaattatattttctgacttctttaaaaccccctcttacaaacagaagctccctttt 3 	tgaagctcattggttagtttaagcttaataagaagattttattaaattttaatgacgatg 3 	aagtattaaaaggagcataacgaggcaacaaaagtaatgaacacggagaaacaaaagcca 3 	ctatttcagcatcgcagctttctgcaacttttgttttttaatttaagagtttaataaata	acaattgattatagatatatocattaatcoatgatatttatgatataaatagctgttaaa 2 	atctaatgacttttttttttttctaccacggtggatgaaagttatagtactattagccagag 2 	aactcacaacttgatcagataaaatttcataaacacttttacgattggattcgtacgatct 2 	tgggattctgctggagcatttatcaaaaattattagcacgaatgggtttattaatttaaa 2 	tatoctaagggtaattttggaaatoccaatttaaaccgattgagaccgtaccggacttcc 2 	taggggtccttctgacattttcactgttctacccctactcgtgagcccacccttttccca 2	gggtttgactgtccagttcggtaataatctaataactctgtctttgaccgcacgctcgtg 2 	ttgagtaaatgtgttttctgactattgaggggcaaaaaaaa	
480	420 420	360	300	240 240	180	120 120	060	000	940 940	088	820 820	760	700	640 640	580 580	520 520	460	400

4560		. 4
6	501   aagttaattactaccaaattgttacgtattatataagttattatagaattattctatta	у 4
4500 4500	.441 ttcttgcaagcttgccctaaagccgttgaagagcttagggtaagataattataacagcac	Qy 44 Db 44
4440 4440	381 cttagtttgttatttgccggacatgagacttcttctgtagccattgctctcgctatcttc	Qy 43 Db 43
4380 4380	321 cttttgggatgggttttgaaacattcgaatttatcgacggagcaaattctcgatctcatt 	Oy 43 Db 43
4320 4320	.261 gaggatgaagcagagatgagtaagagtgatcatgttaggaaacaaagaacgacgatgat 	4 4
4260 4260	201 atggaagagagaaaattggatatcaaggaagaagatcaagaagaagaagaagaagtgaaaaca 	Qy 42 Db 42
4200 4200	141 aaaatatotaaaatggttgtgtagtoacgagcaacgatattgaagttcattgagaggaaa 	Qy 41 Db· 41
4140 4140	4081 ttttgctgtaaagtcacaaactctcattataggtttttaattttattttatgtgttaaat 	ОУ 40 Db 40
4080 4080	4021 tgctcctctaaatctaccaggaactgcttatcataaagctcttcaggtacatttattt	ОУ 40 Db 40
4020 4020	961 agaagaagaacagagcaattaaagaaagagtatgtaactttcatgaaaggagttgtctc 	Qy 39 Db 39
3960 3960	901 tttaattgaacagtttacgtttaatctaatggcgaagcatataatgagtatggatcctgg 	Qу 39 дь 39
3900	1841 atottitatittgotaaattttittgottatgaatotttagagtttotaacttttttttt 	Qy 38 Db 38
3840 3840	781 tcttggcaacaaaactctattttctctgctcaagacgaggccaaaaaggtttttattttt	Qy 37 Db 37
3780 3780	1721 gcacgtottagaactattotacttaaagatgttgagagacatactttgtttgttcttgat 	Qy 37 Db 37
3720 3720	661 gttcttgttggtgacatgcatagagatatgagaagtatctcgcttaacttcttaagtcac 	. Оу 36
3660 3660	601 ctctttgaatgtagttatcctagaagtataggtgggattcttgggaaatggtcgatgctt 	Qy 36 Db 36
3600 3600	541 ocaacgatogtatcagctgatgctggacttaatagattcatattacaaaacgaaggaag	Qy 35 _ pb 35
3540 3540	481 gactaatgttgtttattttacaggtatggtaagatatatagatcgaacttgtttggagaa 	Qy 34 Db 34
3480	421 caagtaaacaacaacatettecaaaaactecaaaaaataaateetetgtttttgaaattt	Db 34

Qy 5581 ctctattaattataacaactatcaaatcgg	Oy 5521 atgacttgtacgtgcgttagattctgccac	5461 gatacaatttaagatttgacggacgatgg 	5401 taggagctgcctaaatattcttataatcg	5341 gtgttggtgtaagtgtacgtgaagacaat 	281 cgtcatggatcattgatcacatgaaagca 	5221 agaactattaatctggcaaaaactttta	5161 ttcatctattgcatgaatagatacgtcct 	5101 atggcaacaggtaaataaaaagtttctct	041 ctcagccytacatttggataattctcgtt 	4981 ttcttaatgttggaaaaaggatacgata 	4921 aataatgaaatccggaatattgaaatctt	61 catcgcaaagcactcaaagatgttcggta 	4801 ttggtgtgtgtgaaggttataaatgaaac 	Qy 4741 ctcattatttattctatgttcatatgatti	81 aattaaattgggatgattacaagaaaatg 	Qy 4621 tacttttgaaggaagagcatcttgagatcg	
gcgaattagagaaatatactatatagtatta 5640 	cgttgactggttttaatacttagatttataa 5580 	cacggctttgacggatctcacacgcccg 552 	4 6	taattagtaggatggtatgtctttaatgacg 5400 	tataaattaaaaataagagagaaagagac 5340 	ttattattatctttcaagttagatcttaaca 5280 	acgtgatttacctatctatagatactatacg 5220 	.cgttaactatcgaaaattagtgtatagtttt 5160 	ř ř	tocotagigggiggaaagigitacoggigat 5040 	attggatgaaaaatattaaaataatttacat 4980 	caaaggtaaaactttacgtacaaaattttta 4920 	tottogattgggaaatgtagttaggttfttg 4860 	tatgatgaaaccaaaattattgatttttttt 4800 	gactttactcaatgtgtatgttactatcatt 4740 	gcgagggccaagaaggaactaggagagtcag 4680 	altigicactaattttatgtttattgattta 4620

y dd yo QΥ

Db Qy

Вþ

```
6121
                                                                                                                                                           6541
                                                                                                                                                                                                                          6481
                                                                                                                                                                                                                                                       6481
                                                                                                                                                                                                                                                                                     6421
                                                                                                                                                                                                                                                                                                                                                   6361
                                                                                                                                                                                                                                                                                                                                                                                  6361
                                                                                                                                                                                                                                                                                                                                                                                                                  6301
                                                                                                                                                                                                                                                                                                                                                                                                                                                 6301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5701
 6721
                                                                                                                                                                                                                                                                                                                                                cctgtcaattatggatacacctcctatgacggtttccaaactttatcttgattcttatcg
                                                                                                                                                                                                                                     actcgtgtgtgtctagtgggaaatcattgggctggagactgaacatcagaacacaagaaa
                                                                                                                                                                                                                                                                                  tttgagaaaagggtttcgactttcgaaagtggacgatgtatatagattgggagctaggtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ccaatgatatataaaaatttggataaataatattattggatattcgttttttagttcggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atctagttcttaaattcaattgggaattagcagaagatgatcaaccatttgcttttcctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                atctagttcttaaattcaattgggaattagcagaagatgatcaaccatttgcttttcctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggccaaggctatgtgctggttcagagctagccaagttagaaatggcagtgtttattcatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggccaaggctatgtgctggttcagagctagccaagttagaaatggcagtgtttattcatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            catcytcaggaagtggtagtttttcgacgtggggaaacaactacatgccgtttggaggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          catcgtcaggaagtggtagtttttcgacgtggggaaacaactaccatgccgtttggaggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtgatttataaaatcggtttgtcgttttttttttgtgacgagcagcaaaacaacggagcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtgatttataaaatcggtttgtcgttttttttttgtgacgagcagcaaaacaacggagcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccaacaagcacgtgttcttcttcctttttttcttcccaacttctttttttgggggtttatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | tagtgagtggggaaggtaagaggtggtgagatgattaatgaccccacgtggtgtggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttatgattattatgagataatactttatgaaataagataataatggtagtcatgatgtta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | tratgattattatgagataatactttatgaaataagataataatggtagtcatgatgtta
ctgtttcttgggtcctattcctttaaatgagaggtttcgtttttacttcttctatctca
                                               tgttacattgacacaaagagttaggtgtcaaaaggactaaatgaataacaatagctctca
                                                                                                                                                                                                                       actcgtgtgtgtctagtgggaaatcattgggctggagactgaacatcagaacacaagaaa
                                                                                                                                                                                                                                                                                                                                                                                                                gagtctttggacatttgtattggatgttgttgattattagtgtcgacactattaaacctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccaatgatatataaaaatttggataaataatattattggatattcgttttttagttcggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tagtgagtggggaaggtaagaggtggtgagagatgattaatgaccccacgtggtgtgtg
                             tgttacattgacacaaagagttaggtgtcaaaaggactaaatgaataacaatagctctca
                                                                                                                                                          cctgtcaattatggatacacctcctatgacggtttccaaactttatcttgattcttatcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tttgagaaaagggtttcgactttcgaaagtggacgatgtatatagattgggagctaggtt
                                                                                                                                                                                                                                                                                                                                                                                                                                               6360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6060
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6060
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5940
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5940
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5700
                                                                                                                                                                                                                                                                                     6480
                                                                                                                                                                                                                                                                                                                                                   6420
                                                                                                                                                                                                                                                                                                                                                                                 6420
                                                                                                                                                                                                                                                                                                                                                                                                                  6360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6300
 6780
                                                            6720
                                                                                             6660
                                                                                                                            6660
                                                                                                                                                          6600
                                                                                                                                                                                       6600
                                                                                                                                                                                                                       6540
                                                                                                                                                                                                                                                      6540
                                                                                                                                                                                                                                                                                                                  6480
                               6720
```

04 04 05 09

40 A0 A0 A0

QΥ

밁

Qy Ъ Qy 밁 Qy 뫄 Ω В Qy Вр Q 망 ž Вþ QΫ́ Дb

В

```
RESULT
AAF58252/
ID AAF5
XX AAF5
XX AAF5
XX AAF5
XX Blec
XX Gene
XX Gene
XX Gene
XX Gene
XX WO2(
YN WO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                Вb
                                                                                                                     QY
                                                                                                                                                                    멍
B
                              QΥ
                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 8
                                                                                                                                                                                                            1508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAF58252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6721
                                                                                                                                                                                                                                                                                                                                                                                         acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Umek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Oligonucleotide D1835
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Nucleic acids containing el hybridization assays, e.g.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Electron-transfer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24-APR-2001
                                         1628
                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The present invention relates to a composition comprising
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26-JUL-2000;
  673
                                                                                                                                                                    793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               atcttttgaagacaggtcttttccaagtcctagttcaggccaaagctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            atcttttgaagacaggtcttttccaagtcctagttcaggccaaagctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tcatctttaggatcctcttctagacgagtaaagtaatcctcgttaccaagcaatggtctc
  tatgtgattattccaaatacatactttggatgtttaaacttaatcttgtttcttcctacg
                                                                                  expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tcatctttaggatcctcttctagacgagtaaagtaatcctcgttaccaagcaatggtctc
                                                                                                                                                                                                                                                     Similarity
8; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6,
                                                                                                                                                                                                                                                                                                                                                           936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Page
                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                         BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99US-0145695
2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 127;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    r group;
                                                                                                                                                                                                                                                                                                                                                           4
                                                                                                                                                                                                                                                                                                                                                         A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        entry)
                                                                                                                                                                                                                                                                        1.0%;
                                                                                                                                                                                                                                                                                            3.6%;
                                                                                                                                                                                                                                                                                                                                                         139 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ETM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          electron-transfer group, useful as labels in g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                     589;
                                                                                                                                                                                                                                                   ; Score 251; DB
Pred. No. 1.2e-
589; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 English.
                                                                                                                                                                                                                                                                                                                                                           10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mismatch;
                                                                                                                                                                                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                           7
                                                                                                                                                                                                                                                                                                                                                         Τ;
                                                                                                                                                                                                                                                                    DB 22;
.2e-30;
                                                                                                                                                                                                                                                                                                                                                           776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     genotyping;
                                                                                                                                                                                                                                                       184;
                                                                                                                                                                                                                                                                                          Length 936;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          two
                                                                                                                                                                                                                                                   0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nucleic
                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6780
                                         1687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6840
  614
                                                                                  674
                                                                                                                           1627
                                                                                                                                                                    734
                                                                                                                                                                                                                                                     0,
```

```
PI Y PA X F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                            ô
                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                              뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
Umek RM;
                                                                                                                            Electron-transfer group;
                                                                                                                                             Oligonucleotide D1875
                                                                                                                                                                                           AAF58254 standard; DNA; 936
                              26-JUL-1999; 99US-0145695
17-MAR-2000; 2000US-0190259
                                                      26-JUL-2000; 2000WO-US20476
                                                                      01-FEB-2001
                                                                                                                                                             24-APR-2001
                                                                                                                                                                             AAF58254;
                                                                                                                                                                                                                                                  2288 a 2288
                                                                                                                                                                                                                                                                                                                                                                                2048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1868
               (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                             433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           613
                                                                                                                                                                                                                                   13 W 13
                                                                                                                                                                                                                                                                   73
                                                                                                                     expression;
                                                                                                                                                                                                                                                                  atattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacatttt 1927
                                                                                                                                                                                                                                                                               gttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattatataagcctat 2287
                                                                                                                                                                                                                                                                                                 attatgaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatcta
                                                                                                                                                                                                                                                                                                                                                                                               aatttaaagacaaaatttttgaaaaaatgttataatttctaacaatattattaaaaatatga 1987
                                                                                                                                                                                                                                                                                                                                                                                                                                                            МИМИМИМИМИМИМИМИМИМИМИМИМИМИМИМИТ <u>AAGCWMMIMMIMMIMMIMMIM</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtatgtttttgttgccataatgacagcctctacaactgtgatagtcaattttttctgcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtataaatattaatcatcgaggtaaaaaaagttttgtcttattttcgcgatgcatgaagg 1747
                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                             ETM; mismatch;
                                                                                                                                                                                            ВP
               INC
                                                                                                                            genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                             2047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1867
                                                                                                                                                                                                                                                                                                                                                               194
                                                                                                                                                                                                                                                                                                                                                                                              254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           494
                                                                                                                                                                                                                                                                                                74
                                                                                                                                                                                                                                                                                                                                                                                                                             314
                                                                                                                                                                                                                                                                                                                                                                                                                                                            374
```

```
Ş
                                                                                맑
                                                                                                     ρ
                                                                                                                               밁
                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                          Š
                                   밁
                                                                                                                                                  Qy
                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                            QV
                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SXCCCCCXXXXTTXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                   1988
                                                                                                                                                                                                                                                                                                                                           1808
                                                                                                                                                                                                                                                                                                                                                                                        1748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present invention relates to a composition comprising two nuclei acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                                                                                 1928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 936 BP; 4 A; 144 C; 7 G; 5 T; 776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Example 6; Page 127; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on a single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                    493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
attatgaaccaataatagttggtgaattcaaatatctcccattaatattttttgaaatcta
                                                                                                                                                                                                                                                                                                                                                                             cagaaacttccaaattttttttttttatggaacaagaaataacagatagaaaactatttt
                                                                                                     aatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaatatga 1987
                                                                                                                                                                                                                                                                     atattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacatttt 1927
                                                                                                                                                                                                                                                                                                                   gtatgtttttgttgccataatgacagcctctacaactgtgatagtcaattttttctgcaa 1867
                                                                                                                                                                                                                                                                                                                                                                 gtataaatattaatcatcgaggtaaaaaaagttttgtcttattttcgcgatgcatgaagg 1747
                                                                                                                                                                                                                                                                                                                                                                                                                                                           gttagttggaatttaataagagcgaacttgtaacattacaatatttatattagatactag 1627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.6%; Score ....
1.0%; Pred. No. 1.2e-30.
""ative 589; Mismatches 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nucleic
                                                                                                                               194
                                                                                                                                                                           254
                                                                                                                                                                                                 2047
                                                                                                                                                                                                                        314
                                                                                                                                                                                                                                                                                                                 434
                                                                                                                                                                                                                                                                                                                                                                494
                                                                                                                                                                                                                                                                     374
```

```
AAF58257/
ID AAF5
                                                                                         δÃ
                                                                                                          망
                                                                                                                        Qγ
                                                                                                                                                                                  Ş
                         Ş
                                          В
                                                        8
                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                           Matches
                                                                                                                                                Query Match
Best Local 9
                                                                                                                                                                                                The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                          1568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2288
                                                                                                                   Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses o
                                                                                                                                                                                                                                                                                                                                                                                                                                    Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Electron-transfer gene expression; s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Oligonucleotide D1954
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAF58257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAF58257 standard; DNA;
                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                         Example 6; Page 127; 159pp; English
                                                                                                                                                                                                                                                                          a single surface
                                                                                                                                                                                                                                                                                                           WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                          26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                   26-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                    01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                    WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-APR-2001
                                                                                                                                                                                                                                                                                                                                           (CLIN-) CLINICAL MICRO SENSORS
                                           673
                                                                           733
                                                                                                          793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13 W 13
                                                                                                                                          Local Similarity
nes 8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a 2288
                         gtataaatattaatcatcgaggtaaaaaagttttgtcttattttcgcgatgcatgaagg
                                                                                         gttagttggaatttaataagagcgaacttgtaacattacaatatttatattagatactag
                                                                                                          tatgtgattattccaaatacatactttggatgtttaaacttaatcttgtttcttcctacg 1687
                                                                          936
                                                                                                                                          Conservative
                                                                                                                                                                                  BP;
                                                                                                                                                                                                                                                                                                                                                          99US-0145695
2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                   2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                                                                                                                                 <sub>5</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                           group;
                                                                                                                                                                                 Α;
                                                                                                                                                3.6%;
                                                                                                                                                                                 142 C; 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              936
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ETM;
                                                                                                                                           589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ВP
                                                                                                                                                 Score 251;
Pred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                            mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                            INC.
                                                                                                                                                                                 G;
                                                                                                                                          ore 251; DB 22;
d. No. 1.2e-30;
Mismatches 184;
                                                                                                                                                                                 σ
                                                                                                                                                                                 Ŧ,
                                                                                                                                                                                 776
                                                                                                                                                                                  other;
                                                                                                                                          184;
                                                                                                                                                        Length 936;
                                                                                                                                          Indels
                                                                                                                                          0;
                                                                                                                                          Gaps
                         1747
                                                                                         1627
          554
                                                                                                          734
                                          614
                                                                         674
                                                                                                                                                                                                                                                                                   on
                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                 γ
                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
 RESULT 5
AAF58259/c
                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                   2168
                                                                                                                                                                                                                                                                                                                                                                                                    2108
                                                                                                                                                                                                                                                                                                                                                                                                                                    2048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1748
Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses or
                                                                                                                                                                                         Oligonucleotide D2004
                                                                                                                                                                                                                         AAF58259;
                                                                                                                                                                                                                                        AAF58259 standard;
                                                                                                                                                                                                                                                                                                  2288
                                                                                                                                  WO200107665-A2
                                                                                                                                                                                                         24-APR-2001
                         WPI; 2001-159728/16.
                                                                         26-JUL-1999;
17-MAR-2000;
                                                                                                                 01-FEB-2001
                                                                                                 26-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     493
                                                                                                                                                                                                                                                                                                                                                   133
                                                                                                                                                                                                                                                                                                                                                                                   193
                                                                                                                                                                                                                                                                                                                                                                                                                    253
                                                                                                                                                                                                                                                                                                                                                                                                                                                    313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    373
                                                                                                                                                                                                                                                                                                                  73
                                                                                                                                                                                                                                                                                  13 W 13
                                                                                                                                                                                                                                                                                                 þ
                                                                                                                                                                                                                                                                                                  2288
```

```
Electron-transfer group;
gene expression; ss.
(CLIN-) CLINICAL MICRO SENSORS INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   atattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacatttt 1927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gttgtggaatggaagtagtaatatacattaagcaaattttaaaaaaattatatagcctat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             attatgaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaatatga 1987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cagaaacttccaaatttttttttttttatggaacaagaaataacagatagaaaactatttt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       99US-0145695
2000US-0190259
                                                              2000WO-US20476
                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                        DNA;
                                                                                                                                                                                                                                                                        936
                                                                                                                                                                       ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2047
                                                                                                                                                                                                                                                                                                                                                                                        14
                                                                                                                                                                                                                                                                                                                                                                                                                                                               2227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          494
                                                                                                                                                                                                                                                                                                                                                                                                                                      74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        314
```

on

```
В
                   Ş
                                         밁
                                                           Ş
                                                                                В
                                                                                                  δÃ
                                                                                                                       밁
                                                                                                                                       Ş
                                                                                                                                                             밁
                                                                                                                                                                               Ş
                                                                                                                                                                                                      밁
                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                  1928
                                                                                                                                                                                                                                                                                                          1868
                                                                                                                                                                                                                                                                                                                                                1808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                    2288 a 2288
                                                                                                                                                                                                                           1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 936 BP; 6 A; 138 C; 8 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       monitoring gene expression.
                                                                                                                                                                                                                                                                                      433
                                                                                                                                                                                                                                                                                                                             493
                                                                                                                                                                                                                                                                                                                                                                   553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              single
   13 W 13
                                          73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity es 8; Conserv
                                                                                                                                                                          attatgaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatcta
                                                                                                                                                                                                                                                                                               atattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacatttt
                                                                                                                                                                                                                                                                                                                                        gttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattatataagcctat
                                                                                caaattattaatatttagtcaataacaatgcatagaaagttccaaaaaaattttgttaa
                                                                                                                                                               gttagttggaatttaataagagcgaacttgtaacattacaatatttatattagatactag
                                                                                                   cagaaacttccaaattttttttttttatggaacaagaaataacagatagaaaactattt
                                                                                                                       aatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaatatga
                                                                                                                                                                                                                                                                                    gtataaatattaatcatcgaggtaaaaaagttttgtcttattttcgcgatgcatgaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                              tatgtgattattccaaatacatactttggatgtttaaacttaatcttgtttcttcctacg 1687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6; Page 128; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.6%; Score 251; DB 22;
1.0%; Pred. No. 1.2e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches 184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                           1747
                                                                                                                                                                                  2107
                                                                                                                                                                                                                                                                 1987
                                                                                                                                                                                                                                                                                                        1927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1627
                                                                                74
                                                                                                                                                                                                                         2047
                                                                                                                                                                                                                                                                                                                                                                  494
                                                                                                                                                                                                                                                                                                                                                                                      1807
                                                                                                                                                                                                                                                                                                                                                                                                         554
                                                                                                                                                                                                                                                                                                                                                                                                                                              614
                                                                                                                       134
                                                                                                                                                              194
                                                                                                                                                                                                      254
                                                                                                                                                                                                                                                                                     374
                                                                                                                                                                                                                                                                                                                             434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
```

```
Š
                                          8
                                                                  밁
                                                                                      Qγ
                                                                                                              В
                                                                                                                                   Ş
                                                                                                                                                          밁
                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                             RESULT 6
AAF58262/c
ID AAF58262 standard; DNA;
                      DЬ
                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                          The present invention relates to a composition comprising two nucleifs each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatcle acids) and single-nucleotide polymorphisms, e.g. for genotyping,
1808
                                                                                                                                                                                  1568
                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                     1628
                                                                                                                                                                                                                                                                                                                                  monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                            Example 6; Page 128; 159pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                            Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26-JUL-1999; 99US-0145695.
17-MAR-2000; 2000US-0190259.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                26-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Electron-transfer group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Oligonucleotide D2007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAF58262;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (CLIN-) CLINICAL MICRO SENSORS
                                                                   613
                                                                                                              673
                                                                                                                                                           733
                                                                                                                                                                                                        793
                                                                                                                                                                                                                                                    Local Similarity hes 8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                     single surface
gtatgtttttgttgccataatgacagcctctacaactgtgatagtcaattttttctgcaa
                      gtataaatattaatcatcgaggtaaaaaagttttgtcttattttcgcgatgcatgaagg
                                                                                                                                 tatgtgattattccaaatacatactttggatgtttaaacttaatcttgtttcttcctacg
                                                                                                                                                           gttagttggaatttaataagagcgaacttgtaacattacaatatttatattagatactag 1627
                                                                                                                                                                                                       expression;
                                                                                                              936 BP; 5 A; 139 C; 10
                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                                                   3.6%; Score 251; DB 27
1.0%; Pred. No. 1.2e-30;
tive 589; Mismatches 18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ETM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mismatch; genotyping;
                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                             ġ
                                                                                                                                                                                                                                                                                                             Τ;
                                                                                                                                                                                                                                                                                                             776
                                                                                                                                                                                                                                                                                                                                            substitutions (mismatches)
for genotyping,
                                                                                                                                                                                                                                                    184; Indels
                                                                                                                                                                                                                                                                         22;
                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                   Gaps
                      494
                                                                                       1747
                                                                                                              614
                                                                                                                                                          674
```

```
Q
                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                Вį
                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ·δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                  RESULT 7
AAF58255/c
                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                 2228
                                                                                                                                                                                                                                                                                                                                                                                                                                 2108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1928
                                                                                                                                    26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                   gene expression; ss
                                                                                                                                                                                                                           Oligonucleotide
                                                                                                                                                                                                                                                                          AAF58255 standard; DNA;
                                                                                                                                                                                                                                                                                                                                  2288 a 2288
                                   Nucleic acids containing enhybridization assays, e.g.
                                                             WPI; 2001-159728/16.
                                                                                                             26-JUL-1999;
17-MAR-2000;
                                                                                                                                                     01-FEB-2001
                                                                                                                                                                    WO200107665-A2
                                                                                                                                                                                     Synthetic
                                                                                                                                                                                                           Electron-transfer group;
                                                                                                                                                                                                                                            24-APR-2001
                                                                                                                                                                                                                                                            AAF58255;
               Example 6;
                                                                                             (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                433
                                                                                                                                                                                                                                                                                                                                                                                 133
                                                                                                                                                                                                                                                                                                                                                                                                                 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                493
                                                                                                                                                                                                                                                                                                                   13 W 13
                                                                                                                                                                                                                                                                                                                                                 73
                               single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         atattaaattaggaattcaatgctactatcaatagaagaagcagctgagtattacatttt 1927
                                                                                                                                                                                                                                                                                                                                                  gttgtggaatggaagtagtaatatacattaagcaaatttttaaaaaaattatataagcctat 2287
                                                                                                                                                                                                                                                                                                                                                                                 aatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaaatatga 1987
                                                                                                                                                                                                                                                                                                                                                                                                cagaaacttccaaatttttttttttttatggaacaagaaataacagatagaaaactatttt 2227
                                                                                                                                                                                                                                                                                                                                                                                                                attatgaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Page 127;
                                                                                                             99US-0145695
2000US-0190259
                                                                                                                                                                                                                                           (first entry)
                                     containing electron-transfer assays, e.g. for genotyping,
                                                                                                                                                                                                                           D1876
              159pp; English
                                                                                                                                                                                                                                                                           938
                                                                                                                                                                                                           ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                           ВP
                                     group, useful as labels in allowing repeat analyses on
                                                                                                                                                                                                                                                                                                                                                 14
                                                                                                                                                                                                                                                                                                                                                                                 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                               2107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               254
```

The

present invention relates to a composition comprising two nucleic

AAF58252 ID AAF5

AAF58252 standard; DNA; 936 BP

RESULT

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8×66666
                                                                                   g
                                                                                                                                                 δõ
                                                                                                                                                                         밁
                                                                                                                                                                                            γQ
                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                             Дb
                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                   δõ
                                         멍
                                                            Q
                                                                                                        Š
                                                                                                                               Д
Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                              2228
                                                                                                                                                                                                                                        1988
                                                                                                                                                                                                                                                                                  1928
                                                                                                                                                                                                                                                                                                                            1868
                                                                                                                                                                                                                                                                                                                                                                      1808
                                                                                                                                                                                                                                                                                                                                                                                                                1748
                                                                                                                                                                                                                                                                                                                                                                                                                                                           1688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2168
                                                                                                                                                                                              2048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 938 BP; 4 A; 144 C; 9 G; 5 T; 776 other
                   2288 a
                                                                                                                                                                                                                                                                                                      433
                                                                                                                                                                                                                                                                                                                                                                                             553
                                                                                                                                                                                                                                                                                                                                                                                                                                      613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          733
                                                                                     133
                                                                                                                               193
                                                                                                                                                                         253
                                                                                                                                                                                                                   313
                                                                                                                                                                                                                                                                                                                                                  493
13
                                         73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ε
                                                                                                                                                                                                                                                                                                                  atattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacatttt 1927
                                                                                                                                                                                                                                                                                                                                                                   gtatgtttttgttgccataatgacagcctctacaactgtgatagtcaattttttctgcaa 1867
                                                                                                                                                                                                                                                                                                                                                                                                              gtataaatattaatcatcgaggtaaaaaagttttgtcttattttcgcgatgcatgaagg 1747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tatgtgattattccaaatacatactttggatgtttaaacttaatcttgtttcttcctacg 1687
::: : :::::: :: :: ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gttagttggaatttaataagagcgaacttgtaacattacaatatttatattagatactag 1627
                                         gttgtggaatggaagtagtaatatacattaagcaaattttaaaaaattatataagcctat 2287
                                                                                                      cagaaacttccaaatttttttttttttatggaacaagaaataacagatagaaaactattt 2227
                                                                                                                                                  attatgaaccaataatagttggtgaattcaaatatctccattaatattttttgaaatcta
                                                                                                                                                                                                                   aatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaaaatatga
                                                                                                                                                                                                                                                                                                      ИМИМИМИМИМИМИМИМИМИМИМИМИМИМИМИМИМИТ AAGCHWINIMIMIMIMIMIMIMIMIMI
                                                                                                                                                                                                                                                                                                                                               2288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
8; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3.6%;
llarity 1.0%;
Conservative 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               589;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pred. No. 1.2e
89; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 251;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1.2e-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 938;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                614
                                                                                                                                                   2167
                                                                                                                                                                                              2107
                                                                                                                                                                                                                                                                                  1987
                                                                                     74
                                                                                                                                                                                                                                                                                                                                                                                            494
                                                                                                                                                                                                                                                                                                                                                                                                                                      554
                                                                                                                               134
                                                                                                                                                                         194
                                                                                                                                                                                                                   254
                                                                                                                                                                                                                                       2047
                                                                                                                                                                                                                                                             314
                                                                                                                                                                                                                                                                                                      374
                                                                                                                                                                                                                                                                                                                                                  434
```

```
Ş
                           В
                                          δ
                                                              밁
                                                                              Qγ
                                                                                                  밁
                                                                                                                Qy
                                                                                                                                      밁
                                                                                                                                                     Qy
                                                                                                                                                                          당.
                                                                                                                                                                                         Š
                                                                                                                                                                                                             밁
                                                                                                                                                                                                                           ٩٥
                                                                                                                                                                                                                                                         Query Match
Best Local :
                                                                                                                                                                                                                                                 Matches
          1904
                                                                                                                                                                                            1604
                                                                                                                                                                                                                      1544 taatgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacat 1603
                                                                                                                                                                                                                                                                                                                      acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                    1724
                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                               monitoring gene
                                                                                                                                                                                                                                                                                                                                                                            Example 6; Page 127; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                              hybridization assays, e.g.
a single surface -
                                                                                                                                                                                                                                                                                                                                                                                                       Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                                                                                                                                                                                                   WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Electron-transfer group; ETM; mismatch;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Oligonucleotide D1835
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAF58252;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (CLIN-) CLINICAL MICRO SENSORS
                                                                                                   181
                                                                                                                                                                          61
                                                                                                                                                                                                                                                Local Similarity res 4; Conserv
                                                                                                                                                                                                                                                                                                                                                           present invention
agaaacagctgagtattacattttaatttaaagacaaaatttttgaaaaaatgttataatt
                                                                                ccttttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaac
                                                                                                 aacttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaagttttg
                                                                                                                                                                         tgtgatagtcaattttttctgcaaatattaaattaggaattcaatgctactatcaataga
                                                                                                                                                                                                                                                                                             936 BP; 4 A; 139 C;
                                                                                                                                                                                                                                                 Conservative 596;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       99US-0145695
2000US-0190259
                                                                                                                                                                                                                                                                                                               expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SS
                                                                                                                                                                                                                                                         0.5%;
                                                                                                                                                                                                                                                                3.6%;
                                                                                                                                                                                                                                                                                                                                                           relates to a composition comprising two nucleic
                                                                                                                                                                                                                                                        Pred.
                                                                                                                                                                                                                                                                                              10
                                                                                                                                                                                                                                                                  Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INC.
                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                              ç;
                                                                                                                                                                                                                                                        .
No
                                                                                                                                                                                                                                                           , 250.6;
No. 1.46
                                                                                                                                                                                                                                                                                              7
                                                                                                                                                                                                                                                                                              Τ,
                                                                                                                                                                                                                                                        6; DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  genotyping;
                                                                                                                                                                                                                                                                                              776 other
                                                                                                                                                                                                                                                 185;
                                                                                                                                                                                                                                                                 22;
                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                   936;
                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                               Gaps
          1963
                                            1903
                                                                                 1843
                                                                                                                    1783
                           360
                                                                                                                                      180
                                                                                                                                                                          120
                                                                                                                                                                                                             60
                                                               300
                                                                                                   240
                                                                                                                                                                                                                                                 0,
                                                                                                                                                                                                                                                                                                                                                          RESULT
AAF58254
ID AAF
В
                                                                                                                                                                                                                                                                                                                                                                                                                                          멂
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                 The present invention relates to a composition comprising two nuclei acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches)
and single-nucleotide polymorphisms,
monitoring gene expression.
                                                                                a single
                                                                                                                                                                         26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2084
                                                                                                                    WPI; 2001-159728/16
                                                                                                                                                                                                   26-JUL-2000;
                                                                                                                                                                                                                     01-FEB-2001
                                                                                                                                                                                                                                                          Synthetic
                                                                                                                                                                                                                                                                                    Electron-transfer
                                                                                                                                                                                                                                                                                                      Oligonucleotide D1875
                                                                                                                                                                                                                                                                                                                        24-APR-2001
                                                                                                                                                                                                                                                                                                                                          AAF58254;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2024
                                                               Example
                                                                                                                                                      (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                        WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                           AAF58254 standard; DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2204
                                                                                                                                                                                                                                                                                                                                                                                                                                           721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                        781
                                                                                                                                                                                                                                                                                                                                                                                                                          ataat
                                                                                                                                                                                                                                                                          expression;
                                                                                                                                                                                                                                                                                                                                                                                                        WWWWW
                                                               6,
                                                                                 surface
                                                             Page
                                                                                                                                                                                                                                                                                                                                                                                                        785
                                                                                                                                                                                                                                                                                                                                                                                                                          2328
                                                                                                                                                                        99US-0145695
2000US-0190259
                                                                                                                                                                                                    2000WO-US20476
                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                   group;
                                                             159pp;
                                                                                                                                                                                                                                                                                                                                                            936
                                                                                                                                                                                                                                                                                                                                                           BP
```

```
Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aaataacagatagaaaactattttgttgtggaatggaagtagtaatatacattaagcaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ttttttatatttagttataaatacattatgaaccaataatagttggtgaattcaaatatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ttttaaaaaattatatagcctatacgcgctcaaagtatgttatctagtaggtgtaatta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tccattaatattttttgaaatctacaaattattaatatttagtcaataacaatgcataga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tctaacaatattattaaaatatgatgcctataatgtatttcctatgttcttaaaatattt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           wwwwwwwwwwwwwwwwgcttawwwwwwwwwwwwwwwwww
                                                                                                                                                                                                                                                                                                                                                                                                                                                        ETM; mismatch; genotyping;
English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               600
                                                         9
```

e.g. for genotyping

two nucleic

```
RESULT 10
AAF58257
ID AAF582
XX
AC AAF582
XX
AC AAF582
XX
DT 24-APR
XX
                                                                                      Q
                                                                                                                  Qy
                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                         밁
                                                                                                      В
                                                                                                                                              δõ
                                                                                                                                                               В
                                                                                                                                                                            Ş,
                                                                                                                                                                                           밁
                                                                                                                                                                                                       Š
                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                     ρ
                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                  Ϋ́
                                                                                                                                                                                                                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SQX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1544 taatgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacat 1603
                                                                                                                                                                              2144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                     AAF58257 standard;
        24-APR-2001
                       AAF58257;
                                                                                       2324 ataat 2328
                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                         781
                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                 tttttatatttagttataaatacattatgaaccaataagttggtgaattcaaatatc 2083
                                                                                                                                                                                                                                                            totaacaatattattaaaaatatgatgootataatgtatttootatgttottaaaaatattt 2023
                                                                                                                                                                                                                                                                                         agaaacagctgagtattacattttaatttaaagaccaaaatttttgaaaaaatgttataatt 1963
                                                                                                                                                                                                                                                                                                                                                                             tcttattttcgcgatgcatgaaggataaacctaatgactttaatttttttgaaaatgtaac 1783
                                                                                                                                                                                                                                                                                                                                                                                                                                       tgtgatagtcaatttttctgcaaatattaaattaggaattcaatgctactatcaataga 1903
                                                                                                                                                                                                                                                                                                                                         wwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwww
                                                                                                                                                                                                                                                                                                                                                                      ttttaaaaaattatataagcctatacgcgctcaaagtatgttatctagtaggtgtaatta
                                                                                                                                                                tccattaatattttttgaaatctacaaattattaatatttagtcaataacaatgcataga 2143
                                                                                                                                                                                                                        ccttttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaac 1843
                                                                                                                                                                                                                                                                                                                                                                                                                 aacttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttg 1723
                                                                                                      936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3.6%; Score 250.6; DB 22; ilarity 0.5%; Pred. No. 1.4e-30; Conservative 596; Mismatches 185;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BP;
        (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4 A;
                                     DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             144 C;
                                     936
                                     ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 936;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                       540
                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                           B
                                        οy
                                                                                      망
                                                                                                                                                 밁
                                                                                                                                                                                          Š
В
           Qy
                                                         맑
                                                                     QΥ
                                                                                                   δÃ
                                                                                                                    В
                                                                                                                               δÃ
                                                                                                                                                             Q
                                                                                                                                                                             망
                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                      Matches
              1964
                                                                        1844
                                                                                                                                  1724
                                                                                                                                                               1664
                                                                                                                                                                                                                       1544
                                                                                                                                                                                                                                                                                                                                                                                                                              26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   26-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Electron-transfer group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Oligonucleotide D1954
                                                                                                                                                                                                                                                                                                                                                        a single surface
                                                                                                                                                                                                                                                                                                                                                                                    WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO200107665-A2
421
                                                                                      241
                                                                                                                    181
                                                                                                                                                 121
                                                                                                                                                                             61
                                                                                                                                                                                                          ı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              expression; ss.

                                                                                                                                                                                                                                     4.
                                                                                                                                                                                                                                            Similarity
```

```
The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 936 BP; 5 A; 142 C; 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nucleic acids containing electron-transfer hybridization assays, e.g. for genotyping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Example 6; Page 127; 159pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 taatgcatctttaacatatttattgttagttggaatttaataagagcggaacttgtaacat 1603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tottattttcgcgatgcatgaaggataaacctaatgactttaatttttttgaaaatgtaac 1783
                                                                                                                                                                                                                                                                                                                                                                                                                                                              aacttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttg 1723
                                                                                        agaaacagctgagtattacattttaatttaaagacaaaatttttgaaaaatgttataatt 1963
                                                                                                                                                                                                                                                                               ccttttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaac 1843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tctaacaatattattaaaaatatgatgcctataatgtatttcctatgttcttaaaatattt 2023
                                                                                                                                                                                      tgtgatagtcaattttttctgcaaatattaaattaggaattcaatgctactatcaataga 1903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3.6%; Score 250.6; ilarity 0.5%; Pred. No. 1.4e. Conservative 596; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99US-0145695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ETM; mismatch; genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   φ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                T; 776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6; DB 22;
.4e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        group, useful as labels in allowing repeat analyses or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    185; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                             360
                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                 240
```

0

on

Indels

0

Gaps

0

```
RESULT 11
AAF58259
ID AAF582
XX AAF582
XX AAF582
XX DT 24-APR
XX Electr
KW gene e
XX Synthe
PN W02001
PR 26-JUL
PR 26-JUL
PR 17-MAR
XX 10mek R

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                õ
                                                       The present invention relates to a composition comprising two nucleic acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                                                                                                                                                                                                                                                                           Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26-JUL-1999; 99US-0145695
17-MAR-2000; 2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Oligonucleotide D2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2144
                                                                                                                                                                                                                                                            Example 6; Page 128; 159pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26-JUL-2000; 2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-FEB-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Electron-transfer group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAF58259;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAF58259 standard; DNA; 936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2324 ataat 2328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2024 ttttttatatttagttataaatacattatgaaccaataatagttggtgaattcaaatatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                    single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WWWWW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tocattaatattttttgaaatctacaaattattaatatttagtcaataacaatgcataga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ttttaaaaaattatataagcctatacgcgctcaaagtatgttatctagtaggtgtaatta 2323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aaataacagatagaaaactattttgttgtggaatggaagtagtaatatacattaagcaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ETM; mismatch;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          genotyping;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  660
```

Query Match

Sequence

936

вР;

6 A; 138 C;

8 G;

8 T;

776 other;

Score 250.6;

В 22;

Length 936;

```
AAF58262
ID AAF5
                                                                                                                                                                                                   g
                                                                                                                                                                                                                      δÕ
                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                           RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity 0.5%; Pred. No. 1.4e-30; Matches 4; Conservative 596; Mismatches 185;
       gene
                                                                                                                                                                                                                                                                                                           2144
                                        Oligonucleotide D2007
                                                                                                                                                                              2324
                                                                                                                                                                                                                                                                                                                                                    2084
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1724
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1664
                 Electron-transfer group; ETM; mismatch; genotyping;
                                                             24-APR-2001
                                                                                 AAF58262;
                                                                                                      AAF58262 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1784
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1544 taatgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacat 1603
                                                                                                                                                                                                                                                                                      601
                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                          781 wwww
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                           12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Н
        expression;
                                                                                                                                                                              ataat 2328
                                                                                                                                                                                                                                                       aaataacagatagaaaactattttgttgtggaatggaagtagtaatatacattaagcaaa 2263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    agaaacagctgagtattacattttaatttaaagacaaaattttttgaaaaaatgttataatt 1963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aacttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttg 1723
                                                                                                                                                                                                                     ttttaaaaaattatataagcctatacgcgctcaaagtatgttatctagtaggtgtaatta 2323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ммаммамаммаммамамамамамамамамамамамамамама
                                                                                                                                                                                                                                                                                                                                                                                                                                    tctaacaatattattaaaatatgatgcctataatgtatttcctatgttcttaaaatattt
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ccttttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaac 1843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tottattttcgcgatgcatgaaggataaacctaatgactttaattttttgaaaatgtaac 1783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ч
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tccattaatattttttgaaatctacaaattattaatatttagtcaataacaatgcataga
                                                                                                                                                                                                                                                                                                                                                                                           ttttttatatttagttataaatacattatgaaccaataatagttggtgaattcaaatatc 2083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgtgatagtcaattttttctgcaaatattaaattaggaattcaatgctactatcaataga 1903
                                                                                                                                                          785
                                                           (first entry)
                                                                                                       DNA;
                                                                                                       936
                                                                                                      ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                            720
                                                                                                                                                                                                                                                                                      660
                                                                                                                                                                                                                                                                                                                               600
                                                                                                                                                                                                                                                                                                                                                   2143
                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
```

```
명
                                                                                                                                                                   δõ
                                                                                                                                                                                                                  δõ
                                                                                                                 δÃ
                                                                                                                                                                                            밁
                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                   δÃ
밁
                     Š
                                             Ъ
                                                                   οy
                                                                                             밁
                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nucleic acids containing electron-transfer group, useful as hybridization assays, e.g. for genotyping, allowing repeat a a single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatch and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                     1844
                                                                                                                                                                                                                                                                                                                                                                     1604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                   1544 taatgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacat 1603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present invention relates to a composition comprising two
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Example 6; Page 128; 159pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Umek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26-JUL-2000; 2000WO-US20476
481
                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                              61
            ttttttatatttagitataaatacattatgaaccaataatagttggtgaattcaaatatc 2083
                                                                                                                                                                                                         ccttttactcatagattaattaccgtatgtttttgtttgccataatgacagcctctacaac 1843
                                                                                                                                                                                                                                                                                                                                                                                            agaaacagctgagtattacattttaattttaaagacaaaattttttgaaaaaatgttataatt 1963
                                                                                                                                                                   tgtgatagtcaatttttctgcaaatattaaattaggaattcaatgctactatcaataga 1903
                                                                                                                                                                                            tcttattttcgcgatgcatgaaggataaacctaatgactttaattttttgaaaatgtaac 1783
                                                                                                                                                                                                                                                                                            tctaacaatattattaaaatatgatgcctataatgtatttcctatgttcttaaaaatattt 2023
                                                                                             aacttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttg 1723
                                                                                                                                                                                                                                                                                                                                             4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99US-0145695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5 A; 139 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      3.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                          %; Score 250.6;
; Pred. No. 1.4e
596; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10 G; 6 T; 776 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                         .4e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for genotyping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      substitutions (mismatches)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                            185;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 936;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     s labels in
analyses on
                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                            0
```

δõ

1544 taatgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacat 1603

Query Match Best Local Matches

Similarity 4; Conserv

Conservative

596; Pred.

Mismatches No.

185;

Indels Length

0;

0,

0.5%;

Score 250.6;

6; DB 22; .4e-30;

```
RESULT
AAF58255
        $\times \times \
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                    The present invention relates to a composition comprising two nuclei acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping, monitoring gene expression.
                                                                                                                                                                                                                                                        Example 6; Page 127; 159pp; English.
                                                                                                                                                                                                                                                                                                                              Nucleic acids containing electron-transfer group, useful as labels in Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on a cincle confere
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Umek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO200107665-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Electron-transfer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Oligonucleotide D1876
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2084
     Sequence
                                                                                                                                                                                                                                                                                                                  a single surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  26-JUL-1999;
17-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       26-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAF58255 standard; DNA; 938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ataat 2328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aaataacagatagaaaactattttgttgtgggaatggaagtagtaatatacattaagcaaa 2263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               expression;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              wwww 785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tccattaatattttttgaaatctacaaattattaatatttagtcaataacaatgcataga 2143
                                                                                                                                                                                                                                                                                                                                                                                                                                 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ч
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ttttaaaaaattatataagcctatacgcgctcaaagtatgttatctagtaggtgtaatta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      938
     BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99US-0145695
2000US-0190259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000WO-US20476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
        4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         group;
     Α;
144 C; 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ETM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mismatch; genotyping;
     ç,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INC
     G
     H
':
     776
        other
                                                                                                                                                                                                   two nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 600
```

ð,

밁 Ş

Š 밁 õ 밁

밁

₽.

Ş 밁 õ

밁

```
AAT85307
ID AAT8
XX AAT8
AC AAT8
AC AAT8
AC AAT8
AC AAT8
AC AAT8
AX Aral
XX Aral
XX Cytc
KW Cytc
KW bras
KW teas
XX Aral
XX Aral
XX Aral
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1604
                                                                           Cytochrome P450-type hydroxylase; identification; brassinosteroid; brassinosteroid inhibitor; modified plant; recombinant production;
                                                                                                                                                                                                                                                                                                                                                                                                                                          2144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2084
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1784
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1724
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1664
                                      Arabidopsis
                                                                                                                    Arabidopsis
                                                                                                                                           14-APR-1998 (first entry)
                                                                                                                                                                                                AAT85307 standard; DNA; 4937 BP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1844
                                                                teasterone;
                                                                                                                                                                                                                                                                                     2324 ataat 2328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                             781 wwww 785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                        14
                                                                                                                                                                                                                                                                                                              ttttaaaaaattatataagcctatacgcgctcaaagtatgttatctagtaggtgtaatta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tctaacaatattattaaaatatgatgcctataatgtatttcctatgttcttaaaatattt 2023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ccttttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaac 1843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aacttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttg 172
                                                                                                                                                                                                                                                                                                                                                                 aaataacagatagaaaactattttgttgtggaatggaagtagtaatatacattaagcaaa
                                                                                                                                                                                                                                                                                                                                                                                                                    tccattaatattttttgaaatctacaaattattaatatttagtcaataacaatgcataga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tttttatatttagttataaatacattatgaaccaataatagttggtgaattcaaatatc

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         wwwwwwwwwwwwwwwww
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               agaaacagctgagtattacattttaatttaaagacaaaatttttgaaaaatgttataatt 1963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tgtgatagtcaattttttctgcaaatattaaattaggaattcaatgctactatcaataga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tcttattttcgcgatgcatgaaggataaacctaatgactttaattttttgaaaaatgtaac 1783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              thaliana
                                                                                                                  thaliana cytochrome P450-type hydroxylase
  Location/Qualifiers 968..4773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                              780
                                                                                                                                                                                                                                                                                                                                       2323
                                                                                                                                                                                                                                                                                                                                                                                       2263
                                                                                                                                                                                                                                                                                                                                                                                                                                         2203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1903
                                                                                                                                                                                                                                                                                                                                                               720
                                                                                                                                                                                                                                                                                                                                                                                                                 660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                    Ş
             В
                                                                망
                                                                                       Ş
                                                                                                                                                                                  Query Match
Best Local S
Matches 225
             1222
                                                                                                                                                                                                                                                                                 The present sequence encodes Arabidopsis thallana cytochrome P450-type hydroxylase. The hydroxylase can be used to identify brassinosteroids or brassinosteroid inhibitors, useful to produce plants with modified physiological and/or phenotypic characteristics. The modified plants may show, e.g. stimulation of growth, increased cell elongation, increased wood production,
                                                               1162
                                                                                                                                                                                                          its coding sequence can also be used for the recombinant production of compounds, e.g. teasterone
                                                                                                                                                                                                                                 dry weight, repressed anthocyanin production during growth in light and/or inhibited de-etiolation which is induced, e.g. by cytokinin in the dark or an increase in stress tolerance. The hydroxylase or
                                                                                                                                                                                                                                                                                                                                                                           Claim 1; Pages 48-53; 77pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                  New isolated plant cytochrome P450-type hydroxylase gene - used to identify substances acting as brassino-steroid(s) or brassinosteroid inhibitors for the production of modified plants
                                                                                                                                                                                 Sequence 4937 BP; 1526 A; 864 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        P-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Altmann T,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      27-MAR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                02-OCT-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        intron
                                                                                                                                                                                                                                                                        accelerated seed germination at low temperatures, an increase in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (PLAC ) MAX PLANCK GES FOERDERUNG WISSENSCHAFTEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9735986-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   intron
                                                                                                                  Local Similarity
les 225; Conserv
                        tgctggacttaatagattcatattacaaaacgaaggcacgtctttgaatgtagttatcc
                                                                         caggtatggtaagatatatagatcgaacttgtttggagaaccaacgatcgtatcagctga 3560
             cccggaaacgaaccggtttgttcttcagaacgaagggaagctttttgagtgttcttatcc
                                                             ccggtacggttcggttttcatgacgcatctttttggtgaaccgacgattttctcagctga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1997-489649/45.
                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAW27153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Koncz C,
                                                                                                                   Conservative
                                                                                                                                                                                                        e.g. teasterone.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /number= 6
4577..4673
/*tar-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /number= 3
3990..4083
/*tag= e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /"Lag" e
/number= 4
4163..4247
/*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              96US-0622166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97WO-EP01586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product= c
1484..1679
/*tag= b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /*tag= f
/number= 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /number= 2
2166..3902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1830..1916
/*tag= c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /number=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4355..4445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /number= 1
                                                                                                                            1.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mathur J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cytochrome_P450-type_hydroxylase
                                                                                                                  0;
                                                                                                                               Pred.
                                                                                                                                           Score
                                                                                                                   Mismatches
                                                                                                                                                                                  870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Szekeres MA;
                                                                                                                          92.8; DB 10
No. 4.1e-06;
                                                                                                                                                                                 G; 1677 T; 0 other;
                                                                                                                                           DB 18;
                                                                                                                   192;
                                                                                                                   Indels
                                                                                                                                           Length
                                                                                                                                                                                                                                               by cytokinin,
                                                                                                                                              4937;
                                                                                                                  7;
                                                                                                                                                                                                                                                           light
                                                                                                                  Gaps
                                                                1221
             1281
                                      3620
```

Š

밁 δÕ В

밁 Ş 밁 Ş В

۳,

Š

Š B Ş

밁

0

```
RESULT 15
AAF58238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                  Nucleic acids containing electron-transfer group, useful as labels in hybridization assays, e.g. for genotyping, allowing repeat analyses on a single surface -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1342
                                 acids each containing an electron-transfer group (ETM) having different redox potentials. The invention is used for electronic detection of nucleic acids, especially of substitutions (mismatches) and single-nucleotide polymorphisms, e.g. for genotyping,
                                                                                                                                                                                    WPI; 2001-159728/16
                                                                                                                                                                                                                                                                                                                                                                     Synthetic
                                                                                                                                                                                                                                                                                                                                                                                            Electron-transfer group; ETM; mismatch; genotyping;
gene expression; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                 Oligonucleotide D1250:D1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAF58238;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAF58238 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1575 aaaa 1578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3921 ttaa 3924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3741 acttaaagatgttgagagacatactttgtttgttcttgattcttggcaacaaaactctat 3800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-FEB-2001.
                                                                                                                                                                                                                                                                                                                                              WO200107665-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         24-APR-2001
                                                                                 The present invention relates to a composition comprising two nucleic
                                                                                                          Example 4; Page 120; 159pp; English.
                                                                                                                                                                                                            Umek RM;
                                                                                                                                                                                                                                                         26-JUL-1999; 99US-0145695.
17-MAR-2000; 2000US-0190259.
                                                                                                                                                                                                                                                                                              26-JUL-2000; 2000WO-US20476
 Sequence 244 BP;
                        monitoring gene
                                                                                                                                                                                                                                  (CLIN-) CLINICAL MICRO SENSORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tttctctgctcaagacgaggccaaaaaggtttttatttttatcttttatttttgctaaatt 3860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtgttctcctcatggaagaagccaaaaaggtaaccaaaaaaattcttgcttatcaaaaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  catgcttgatattgaccggttagtccggtttaatcttgattcttgg-----tcttctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   taaacgtatgcactctctcaccatgagctttgctaattcttcaatcattaaagaccatct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tgcttccatttgtaaccttttggggaaacactctctgcttcttatgaaaggttctttgca
                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                        expression.
19 A; 9 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          244 BP
 12 G;
10 T; 194 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1514
                                                                                                                                               on
n
```

Query Match Best Local Similarity

1.3%;

Score 88.2; DB 22; Pred. No. 1.7e-05;

Length

```
20
                                   В
                                                   Qy
                                                                      В
                                                                                     Qy
                                                                                                         В
                                                                                                                        δÃ
                                                                                                                                            Matches
                                                                                                                           1920
                                                    2040
                                                                                        1980
                                    123
 183
                                                                      63
                                                                                                          w
wwwwwwwwwwwwwwtgttaaaagacaccatcaatgaggaagctgcagaa
           gaaatctacaaattattaatatttagtcaataacaatgcatagaaagttccaaaa
                                    ataaatacattatgaaccaataatagttggtgaattcaaatatctccattaatatttttt
                                                                      tacattttaatttaaagacaaaatttttgaaaaatgttataatttctaacaatattatta
                                                                                                                                            21;
                                                                                                                                            Conservative
                                                                                                                                            163;
                                                                                                                                            Mismatches
                                                                                                                                            51;
                                                                                                                                            Indels
                                                                                                                                            0
                   2154
                                                                                                                                           Gaps
                                                                                                                         1979
                                     182
                                                    2099
                                                                      122
                                                                                                         62
```

Search completed: September 29, 2001, 11:29:26 Job time: 14750 sec

• • •		٠.	
			·
·			
	·		
			<b>.</b>

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OM nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            on:
..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              seq length: 0
seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-502-426-1
6888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1344157 seqs, 7733874588 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           September 29, 2001, 06:49:51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                      gb_pat1:*
gb_pat2:*
gb_ph:*
gb_pl1:*
gb_pl1:*
gb_pl3:*
gb_pl3:*
gb_pl4:*
em_ba1:*
em_ba1:*
em_htgo_hum:*
em_htgo_inv:*
em_htgo_hum:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atgtgggtattatattgttg.....cctagttcaggccaaagctt 6888
                                                                                                                                                                                                                                                                                                                                                                                                gb_ba1:*
gb_ba2:*
gb_ba3:*
gb_in1:*
gb_in2:*
gb_in3:*
gb_om:*
                                       em_htg_inv2:*
em_htg_cother:*
em_htg_rod:*
em_hun1:*
em_hun1:*
em_hun3:*
em_hun3:*
em_hun4:*
em_hun5:*
em_hun6:*
                                                                                                                                                                                                                                                                                                                                                                                         gb_ov:*
em_in:*
em_om:*
em_or:*
                                em_hum7:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; Search time 8875.91 Seconds (without alignments) 12003.485 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2688314
```

```
44: em_ph: *
45: em_ph: *
46: em_ph: *
47: em_sy: *
48: em_ro: *
49: em_sy: *
50: em_un: *
51: em_un: *
52: em_vi: *
53: gb_sts: *
54: gb_sts: *
55: gb_sts: *
56: gb_sts: *
57: gb_sy: *
60: gb_htg: *
61: gb_htg: *
62: gb_htg: *
63: gb_htg: *
64: gb_htg: *
65: gb_htg: *
66: gb_htg: *
67: gb_htg: *
67: gb_htg: *
68: gb_htg: *
69: gb_pr: *
6
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIE

(	0 0				0 :	Result No.	
œ <b>-</b>	9 0	υ <b>4</b>	ω	2	- ;	ō ‡	
129.4	130.8	133.2 133.2	134	4818	6753.6	Score	
1.9	1.9	1.9	1.9	69.9	98.0	Query Match	di
14867	104992	104992 169546	100269	4818	84196	Query Match Length DB	
4	60	60	13	12	14	B	
4 AE001398	AC005504	AC005504 AC004157	ATF18022	AF044216	ATT3A5	ID	
AE001398 Plasmodiu	ACOOSSO4 Plasmodiu	ACO05504 Plasmodiu ACO04157 Plasmodiu	AL163817 Arabidops		AL132979 Arabidops	Description	

•	COMMENT On Jan 2/, 2000 this sequence version replaced gi:043424/.  Information on performance of analysis and a more detailed annotation of this entry and other sequences of chromosomes 3, 4 and 5 can be viewed at: http://www.mips.biochem.mpg.de/proj/thal/FEATURES  Location/Qualifiers	Bic Coc d'1	Magnoliophyta; eudicotyledons; core eudicots; Rosidae; REFERENCE 1 (bases 1 to 84196) AUTHORS Bloecker, H., Mewes, H.W., Lemcke, K., Mayer, K.F.X., Quet JOURNAL Unpublished REFERENCE 2 (bases 1 to 84196) AUTHORS EU Arabidopsis sequencing, project. TITLE Direct Submission JOURNAL Submitted (25-7AN-2000) MIDS, at the Max-Planck-Instit	RESULT 1 ATT3A5/c LOCUS ATT3A5/S LOCUS ATT3A5 84196 bp DNA DEFINITION Arabidopsis thaliana DNA chromosome 3, ACCESSION AL132979 VERSION AL132979.2 GI:6782244 KEYWORDS SOURCE thaliana cress. ORGANISM Arabidopsis thaliana EUKaryota; Viiidiplantae; Embryophyta;	ALIGNMENTS	98.2 1.4 12029 4 97.4 1.4 62268 92 97.2 1.4 15953 85 97.1 1.4 15953 85 96.8 1.4 19569 75 96.6 1.4 234112 96 96.4 1.4 24293 83 96.1 4 146285 85 95.8 1.4 155012 78 95.6 1.4 155012 78 95.6 1.4 155010 60	24 102.6 1.5 15643 5 A 25 101.4 1.5 178087 85 26 101.2 1.5 15421 96 27 100.8 1.5 152209 92 28 100.8 1.5 189450 79 29 99.6 1.4 180741 75 30 99.4 1.4 175223 85 31 99.4 1.4 310779 60 33 99.4 1.4 310779 60 34 98.4 1.4 185603 74 35 98.4 1.4 1610 6 M	128 1.9 106142 127.8 1.9 86827 125.4 1.8 86827 125.4 1.8 19517 124.4 1.8 19517 123.4 1.8 67970 123.6 1.8 4501 122.6 1.8 767970 118 1.7 67970 118 1.7 67970 118 1.7 84196 113 1.6 152209 105.6 1.5 176174 103 1.5 1301174 103 1.5 1301174
	-	rue	od II;	AN-2000	. in		Ombyx mo Homo sapi falciparu Human DNA Homo sapi Homo sapi Saccharom Homo sapi Plasmodiu Homo sapi	
	CDS	exon gene exon	5 † 1 3 3	exon exon gene	exon intron	intron exon intron	exon .	Source LTR misc_feature LTR gene CDS
	/number=1 complement(1830319931) /codon_start=1 /product="scarecrow-like 7 (SCL7)" /protein_id="CAB62434.1"	/number=1 /number=1 complement(1601416470) /number=2 1830319931 /gene=""3A5.30" complement(1830319931)	tein 1" SMNG SMNG CLKGK	/number = 1397 /number = 1397 /gene="T3A5.10" /number=4 /number=4 /number=1 /number=1 /number=1 15858. 16470 /gene="T3A5.20" /gene="T3A5.20" /note="\$\frac{16470}{16470}\] /note="\$\frac{16470}{16470}\] /note="\$\frac{16470}{16470}\]	/gene="T3A5.10" /number=3 /1305613124	M = M = M = M :	/note="similarity to cyclin-dependent kinase inhibitor (ICK1), Arabidopsis thaliana, EMBL:ATU94772_1" /codon_start=1 /product="putative protein" /protein_id="cAB62432.1" /protein_id="cAB62432.1" /db_xref="GI:6561966" /ttanslation="MAAVRREREDVVEENGVTTTVKRRKMEEEVDLVESRIILSPCV	184196 /organism="Arabidopsis thaliana" /varlety="Columbia" /bb_xref="taxon:3702" /chromosome="3" 2983338 /note="155 bp LTR" 33907564 /note="ITR-transposon" 75657922 /note="157bp LTR" 1233913197 /gene="73A5.10" join(1233912665,1274212803,1288813055,1312513197) /dene="73A5.10"

gene

```
/translation="Mfetehhtllpllllpsllsllfllflllkrrnktrrnlppgks
GWPFLGETIGYLKPYTATTLGOFMQQHYSKYGKIYRSHLFGEPFIVSADAGLHRFILO
NEGRLFECSYPRSIGGILGKWSMLYLVGDMHRDMRSISLNEFLSHARLRTILKDVERH
TLFVLDSWQQNSIFSAQDEAKKTTENLMAKHINSMDPGEEFTEQIKKEYVTFMKGVVS
APLNLPGTAYHKALQSBATILKFIERKMEERKLDIKEEDQEEFEVKTEDEAEMSKSDH
VRKQRTDDDLLGWVLKHSNLSTEQIIDLISLLLFAGHETSSVAIALAIFFLQACPKAV
EELREBHLEIARAKKELGESELWMDDYKKMDFTQCVINETLRICMVVRFLHRKALKDW
EEKREBHLEIARAKKELGESELWHDDYKKMDFTQCVINGASSSGSGSFSTWGN
RYKGYDIPSGWKYLPVISAVHLDNSRYDOPNLFNPWRWQQQNNGASSSGSGSFSTWGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MAYMCTDSGNLMAIAQQLIKQKQQQQQQQQEEQEQEPNPWPN
PSFGFTLPGSGFSDFFQVTNNDGFHFPHLEHHQNAAVASEEFDSDEWMESLINGGDAS
QTNPDFPIKGHDPFVSFPSRLSAPSYLNRVNDDASQQLPPPPASTALWSPSPPSPQ
HPPPPPPQPDFDLNQPIFKAIHDYAKKPETKPDTLIRIKESVSESGDPIQRVCYYFAE
ALSHKETESPSSSSSLEDFILSYKTLNDACPYSKFAHLTANQAILEATNQSNNIHI
VDFGIFGGIQWSALLQALATRSSGKPTAIRISGIPABSIGDSPGPSLIATGNRLRDFA
AILDLWFETYPVLTFTQLLNGSSFRYDDDENLVVNFMLELLKALDETATTVGTALRLA
RSLNPRIVTLGEYEVSLARVEFANRVKNSLRFYSAVFESLEPNLDRDSKERLRVERVL
EGRRINDLVRSDDNNKPGTRGGLMENGEQWRVLMKAGFEPVKPSNYAVSQAKLLLM
                                                                                                                                                                                             /number=8
38307. .4
               /number=1
complement(join(38307. .38796,38877. .39090,39189. .3927
40180. .40242,40337. .40401,40489. .40564,40655. .40734,
40805. .40919,41225. .41323))
/note="Contains Eukaryotic putative RNA-binding region
RNP-1 signature AA179-186"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(27571.
/number=4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(27478.
/number=4
                                                                                                                                                                                                                                                                                                                                                                      complement(28289.
                                                                                                                                                                                                                                                                                                                                                                                                                  complement(28136.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement (27387.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(27308.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(27201.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(27091.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(26339.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement (26093.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VSRIL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDKPFAFPFVDFPNGLPIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="steroid 22-alpha-hydroxylase
/protein_id="CAB62435.1"
/db_xref="GI:6551969"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NYNYSTLYSLVESEPGFISLAWNNVPLLTVSSWR"
                                                                                                                                                  complement (38307.
                                                                                                                                                                  38307. .41323
/gene="T3A5.50"
                                                                                                                                                                                                                                    complement(28779.
                                                                                                                                                                                                                                                                                  complement(28699.
                                                                                                                                                                                                                                                                                                                         complement(28374.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(28038.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(27723.
                                                                                                                                                                                                                                                                                                                                                                                                                                         /number=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /number=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /number=3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /number=3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /number=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /number=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /number=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /number=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
/codon_start=1
                                                                                                                                                                                                                                                             /number=7
                                                                                                                                                                                                                                                                                                         /number=7
                                                                                                                                                                                                                                                                                                                                                    /number=6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="GI:6561968"
                                                                                                                                                    .38796)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .26338)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .27386)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .27200)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .27090)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .27307)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .27722)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           27570)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      27477)
                                                                                                                                                                                                                                                                                                                                                                                                                  28288)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28037)
                                                                                                                                                                                                                                                                                                                             28698)
                                                                                                                                                                                                                                                                                                                                                                         28373)
                                                                                                                                                                                                                                                                                                                                                                                                                                                             28135)
                                                                                                                                                                                                                                                                                    28778)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cysteine heme-iron ligand
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1. .27200,27308. .27386, .28288,28374. .28698,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (DWF4)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               prdrr
```

gene

intron

exon

exon

intron

exon

intron

intron exon intron

intron

CDS

31600

AGAGTATTGAGAAAAAAACGAAAATAAGAAAAAGGGAAAGAGTAGTGACCCATGGAGTATG

31541

```
Qy
                                                    Ş
                                                                                                QΥ
                                                                                                                         밁
                                                                                                                                            δÃ
                                                                                                                                                                                        δõ
                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                               В
                                                                            B
                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                          31959
                                                                                                                                                                                                                                                                                                                                                  32079
                                                                                                                                                                                                                                                                                                                                                                                               32139
                                                                                                                                                                                                                                                                                                        32019
                                                                                                                                                                                                                                                                                                                                                                                                                                           32199
                                31660
                                                                                                                         31780
                                                                                                                                                                     31839
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 intron
                                                                                                                                                                                                                                                                                                                                                                         121
           601
                                                      541
                                                                                                  481
                                                                                                                                               421
                                                                                                                                                                                         361
                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                         6864;
                               taatcgattccatttggttggattacacagttaagtttttgtgttttctttttgttatatgt 300
agagtattgagaaaaaaccgaaaataagaaaagggaaagagtagtgacccatggagtatg
                                                                                                                                                                    CAAAAAAAAAAAAACAAACAAACAAA - ACAATTTTCGATATAGTTTTTGGTTCTGGATT
                                                                                                                                                                                                                           atatgagtaaatcaaaaagagtattgattgaagtgtaaacatatttcgttatgaccccca
                                                                                                                                                                                                                                                           TAATCGATTCCATTTGGTTGGATTACACAGTTAAGTTTTTGTGTTTCTTTTTGTTATATGT
                                                                                                                                                                                                               ATATGAGTAAATCAAAAAGACAATTGATTGAAGTGTAAACATATTTCGTTATGACCCCCCC 31840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(39091.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TDRYSHRYDKMEEDDFRYEREYKRSKRSESREYVR" complement(38797. .38876)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RSRELSHEQPRERSRDRPREDKHHRDRDQGGRDRDRDSRRDRDRTRDRGDRDRRDRDR
GRDRTSRDHDRDRSRKKERDYEGGEYEHEGGGRSRERDAEYRGEPEETRGYYEDDQGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MGDSGDPTLRNPMAAVQARAKVQNRANVLQLKLMGQSHPTGLTN
NLLKLFEPRPLEYKPPPEKRKCPPYTGMAQFYSHFAEPGDPPXFAPPKPEVELPSQKR
REIHKLRLEKGVEKAAEDLKKYDPNNDPNATGDPYKTLFVSRLMYESSESKIKREFES
ERIHKLRLEKGVEKAAEDLKKYDPNNDPNATGDPYKTLFVSRLMYESSESKIKREFES
YGPIKRVHLYTDQLTNKPKGYAFIEYMHTRDMKAAYKQADGQKIDGRRVLVDVERGRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement (40243.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(40180.
/number=4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(39271.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(39189.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(38877.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement (38797.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VPNWRPRRLGGGLGTSRVGGGEEIVGEQQPQGRTSQSEEPSRPREEREKSREKGKERE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="U1 snRNP 70K protein"
/protein_id="CAB62436.1"
/db_xref="GI:6561970"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /number=4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /number=3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /number≃2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /number=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /number-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /number=3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 6753.6;
Pred. No. 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .40336)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .39090)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .40242)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .40179)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .39270)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     39188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 14; Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            84196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
           660
                                                       600
                                                                                                                                                                   31781
                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                          32140
                                31601
                                                                                                                         31721
                                                                                                                                                                                                                                                           31900
                                                                                                                                                                                                                                                                                                      31960
                                                                             31661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
```

30463	TCCTAC-GTATAAATATTAATCATCGAGGTAAAAAAAGTTTTGTCTTATTTTCGCGATGC	30521	문 5
UT 00	tactagtatgtgattaatccaaatacatactttggatgtttaaaccttaatcttgtttc 	58	Db Qy
ŪΝ	ttattgttagttggaatttaataagagcgaacttgtaacattacaatatttatattag 	64	D Q
1560 30642	totacaagogtgtaaccatotgcaactattaaattgctttctttaatgcatctttaacat		D S
1500	cttggattccattcaatgatctaaaatgcatagatcttttgggttacagtttcgaagtcc	1441	B 8
30702		30761	
1440 30762	atatcattcttggttggtcaacaataaaaacaaaaacaagaaaaaaaa	1381 30821	B 6
1380	gataaatgaaattcacacgcgtggtaataattatgggaccgtatgttacgatcactgcaa	132:	.B &
30822		3088:	
1320	gggtatgctatacctttcacgtatgctatactagagactaaagaatagttatgtgatgtc	1261	рь
30882		30941	6
1260 30942	acatatacataattccttacagaaaaaacaaacttaagagaagttaacatatccatatat	120: 3100:	0y
1200	ccggttgttatgtaaatatagatttagtggtaaacaaatatgttaatcaattagtggtca	1141	P 04
31002		31061	
1140	tattatacaaagttacaaactgaatatagcttgaaatcctttagaaaatttttggaatta	1081	Db Qq
31062		31121	
1080 31122	cgattttacagcgtcactagttgagattactagcataaagcataaaggacccgttcaagc	1021	D Q
1020	accattttgaataaactttttctcaaacattacgggacactggactcgacccttaaaata	961	B 5
31182		31240	
960	taactatatattatcgcggatatatgataacaatgatatatcacaaaacaattgtctggg	901	p dq
31241		31300	
900	ggtatttgcataatcttctgtttaaagcatattttgtctttctt	841	
31301		31360	당 영
840	tttgcgataacgattgtgaaaaatattttatttgttagctgatctcaatattatgttcca	781	₽ Q
31361		31420	
780	gccagctttctctcacaatcaatatcgaccctatttggattttctggatattcgttaaaa	721	D Q
31421		31480	
720	tgaataattatcaaagagaataagagatgacaaccaaaaggttgtggaataatggtccct	661	рь
31481		31540	

ø	B	) t	y Qy	<b>0</b> #	0	, ם	γo	B 5	) t	, Q	Db	Qy	D	Qy	ט	Qγ	Qy db	D	Qy	Дb	Ø	Ü	γQ	D	VΩ	D	γQ	b	ø	Qy Db	U	y 0
282	2944	, ,	270	295	264	2962	258	2968		246	b 2980	y 240	ъ 2986	234	b 2992	у 228	y 222 b 2998	30	216	b 3010	y 210	b 3016	у 204	w	у 198	ω	у 192	ω	у 186	y 180 b 3040	304	174
1 acaattyattatagatatatocattaatocatgatatttatgatataaatagotgttaaa	a	2 ANY TENENDE TRANSPORTATION TO THE TENENDE TO THE	1 aactcacaacttgatcagataaaatttcataaacacttttacgatggattcgtacgatct		l tagaattotaotagaacatttatoaaaaattattaacacagaatagattattaatttaa		.l tatoctaagggtaattttggaaatcoccaatttaaaccgattgagaccgtaccggacttoc	ayyyy controlyges to tree of the sacrotactic year controls   1   1   1   1   1   1   1   1   1	2 000111070101010101101101101101117111711		2 TTGAGTAAATGTGTTTTCTGACTATTGAGGGGCAAAAAAAA	ttgagtaaatgtgttttctgactattgaggggcaaaaaaaa		1 tcagaattgggacaacaatgaaaacggaattaaaatattaactttaaaataaat		1 agoctatacgogotoaaagtatgttatotagtaggtgtaattaataatgcatggtgcgat	1 ctattttgttgtggaatggaagtagtaatatacattaagcaaattttaaaaaaattatatata	2 TTGTTAACAGAAACTTCCAAATTTTTTTTTTTTTTTTGGAACAAGAATAACAGATAGAAAA	ttgttaacagaaacttccaaatttttttttttttttatggaacaagaaataacagatagaaaa	2 AAATCTACAAATTATTAATATTTAGTCAATAACAATGCATAGAAAGTTCCAAAAAAATT	1 aaatctacaaattattaatatttagtcaataacaatgcatagaaagttccaaaaaaaa	2 TARATACATTATGAACCAATAATAGTTGGTGAATTCAAATATCTCCCATTAATATTTTTTG	1 taaatacattatgaaccaataatagttggtgaattcaaatatctccattaatattttttg	ATATGATGCCTATAATGTATTTCCTATGTTCTTAAAATATTTTTTTT	1 aatatgatgootataatgtatttootatgttottaaaatatttttttt		l acattttaatttaaagacaaaatttttgaaaaatgttataatttctaacaatattattaa	2 TCTGCAAATATTAAATTAGGAATTCAATGCTACTATCAATAGAAGAAACAGCTGAGTATT	1 totgcaaatattaaattaggaattoaatgotactatcaatagaagaaacagotgagtatt	l aattaccgtatgttttgttgccataatgacagcctctacaactgtgatagtcaattttt	2 ATGAAGGATAAACCTAATGACTTTAATTTTTTGAAAATGTAACCCTTTTTACTCATAGATT	1 atgaaggataaacctaatgactttaattttttgaaaatgtaacccttttactcatagatt
2880	29383	) 4	760	95	70	95	640	29623	ח ע	S G	29743	2460	29803	2400	29863	2340	2280 29923	29983	2220	30043	2160	30103	2100	30163	2040	30223	1980	0	1920	1860 30343	4	800

3959	3900 ttttaattgaacagtttacgtttaatctaatggcgaagcatataatgagtatgggatcctg	Qy 3
3899 28303	3840 tatottttattttgotaaatttttttgtttatgaatotttagagtttotaactttttttt	Qy 3 Db 28
3839 28363	3780 ttcttggcaacaaactctattttctctgctcaagacgaggccaaaaaggtttttatttt 	Qy 3 Db 28
3779 28423	3720 cgcacgtcttagaactattctacttaaagatgttgagagacatactttgtttg	. Qy 3 Db 28
3719 28483	3660 tgttottgttggtgacatgcatagagatatgagaagtatctcgcttaacttcttaagtca 	. Oy 3
3659 28543	3600 gctctttgaatgtagttatcctagaagtataggtgggattctttgggaaatggtcgatgct 	Qy 3 Db 28
3599 28603	3540 accaacgatcgtatcagctgatgctggacttaatagattcatattacaaaacgaaggaag	Qy 3 Db 28
3539 28663	3480 tgactaatgttgtttattttacaggtatggtaagatatatagatcgaacttgtttggaga 	Qy 3 Db 28
3479 28723	3420 ccaagtaaacaacaacatcttccaaaaactcaaaaaataaat	Оу 3 Db 28
3419 · 28783	3360 teggttatettaaacegtacacegccacaacateteggtgacttcatgcaacaacatgtet 	Qy 3 Db 28
3359 28843	3300 gaaaaaccagattcaatctacctccgggtaaatccggttggccatttcttggtgaaacca 	Qy 3 Db 28
3299 28903	3240 ttetteteceategettttgtetettettettettettgattetettgaagagaagaagaata 	Qy 3 Db 28
3239 28963	3180 agagagagagagaaactagctccatgttcgaaacagagcatcatactctctttccttcc	Qy 3 Db 29
3179 29023	3120 ttcagtagaagtccgattcccaatcttaaagacaaagccattagaaagagaaagtgagtg	Оу 3 Db 29
3119 29083	3060 gataacaattatattttotgacttotttaaaaccccctcttacaaacagaagctcccttt 	Oy 3 Db 29
3059 29143	3001 tgaagctcattggtta-gtttaagcttaataagaagattttattaaattttaatgacgat 	Qy 3 Db 29
3000 29203	2941 aagtattaaaaggagcataacgaggcaacaaaagtaatgaacacggagaaacaaaagcca 	Qy 2 Db 29
2940 29263	2881 ctatttcagoatcgcagotttctgcaacttttgtttttaatttaa	Oy 2 Db 29
29323		Db 29

```
Qy
                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                           망
                                                                                                                                                                                                                                                                                                                Ş
         Ş
                   망양
                                          Ър
                                                  Ş
                                                               밁
                                                                        Ş
                                                                                  В
                                                                                             δδ
B
                                                                                                                                       Q
                                                                                                                                                  멍
                                                                                                                                                             Q
                                                                                                                                                                        ₽
                                                                                                                                                                                  Š
                                                                                                                                                                                              В
                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                  Б
                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                 Ş
В
                                           26264
                                                                26324
                                                                                     26384
                                                                                                          26443
                                                                                                                               26502
                                                                                                                                                    26562
                                                                                                                                                                         26622
                                                                                                                                                                                              26682
                                                                                                                                                                                                                   26742
                                                                                                                                                                                                                                        26802
                                                                                                                                                                                                                                                             26862
                                                                                                                                                                                                                                                                                                                             27042
                                                                                                                                                                                                                                                                                                                                                   27102
                                                                                                                                                                                                                                                                                                                                                                        27162
                      26204
                                                                                                                                                                                                                                                                                    26922
                                                                                                                                                                                                                                                                                                         26982
                                5999
                                                                                                                     5759
                                                                                                                                                                                   5579
                                                                                                                                                                                                                              5459
                                                                                                                                                                                                                                                   5399
                                                                                                                                                                                                                                                                        5339
                                                                                                                                                                                                                                                                                                                                        5159
                                                                                                                                                                                                                                                                                                                                                                                  5039
                                                     5939
                                                                           5879
                                                                                                5819
                                                                                                                                          5699
                                                                                                                                                                                                         5519
                                                                                                                                                                                                                                                                                             5279
                                                                                                                                                                                                                                                                                                                   5219
                                                                                                                                                                                                                                                                                                                                                             5099
                                                                                                                                                                        cgtaggagctgcctaaatattcttataatcgtgaccgttgatttattattagtcacggct
                                                                                                                                                                                                                                                            acgtgttggtgtaagtgtacgtgaagacaattaattagtaggatggtatgtctttaatga
                                                                                                                                                                                                                                                                                                        gtcatcgtcaggaagtggtagtttttcgacgtggggaaacaactacatgccgtttggagg
                                                                                          TATAGTGAGTGGGGAAGGTAAGAGGTGGTGAGAGATGATTAATGA-CCCACGTGGTGTGG
                                                                                                                                    tatagtgagtggggaaggtaagaggtggtgagagatgattaatgaccccacgtggtgtgg
                                                                                                                                                                                                    cgatgacttgtacgtgcgttagattctgccacgttgactggttttaatacttagatttat
                                                                GTCATCCTCAGGAAGTGGTAGTTTTTCGACGTGGGGAAACAACTACATGCCGTTTGGAGG
                                                                                     TTGTGATCTATAAAATCGGTTTGTCGTTTTTTTTTGTGACGAGCAACAACAACGGAGC
                                                                                                                                                                                              CGATGACTTGTACGTGCGTTAGATTCTGCCACGTTGACTGGTTTTAATACTTAGATTTAT
                                                                                                                                                               5698
                                                                                                                                                                                   5638
                                                                                                                                                                                                         5578
26085
                               6058
                                           26205
                                                                          5938
                                                                                     26325
                                                                                                5878
                                                                                                                    5818
                                                                                                                                          5758
                                                                                                                                                                                                                             5518
                                                                                                                                                                                                                                        26743
                                                                                                                                                                                                                                                   5458
                                                                                                                                                                                                                                                             26803
                                                                                                                                                                                                                                                                                                                                                             5158
                                                                                                                                                                                                                                                                                                                                                                                   5098
                     26145
                                                                                                          26385
                                                                                                                               26444
                                                                                                                                                    26503
                                                                                                                                                                         26563
                                                                                                                                                                                              26623
                                                                                                                                                                                                                   26683
                                                                                                                                                                                                                                                                                   26863
                                                                                                                                                                                                                                                                                                        26923
                                                                                                                                                                                                                                                                                                                                                   27043
                                                                                                                                                                                                                                                                                                                                                                        27103
                                                                26265
                                                                                                                                                                                                                                                                                                                              26983
```

_	<b>≒ 0</b> □ +	DEF DEF VER	Db RES	Db Qy	Оу	Оу	ру	Оу	Оy	Оy	Оy	Qу	Оy	Db Qy	Оу
TTLE OURNAL	ANI O	INITION ESSION SION	53 68	6779 25424	6719 25484	6659 25544	6599 25604	6539 25664	6479 25724	6419 25784	6359 25844	6299 25904	6239 25964	6179 26024	6119 26084
S., Dilka ann, K.A. WF4 gene tes mult nthesis Cell 10	* *		ctcatctttgaagaca-ggtcttttccaagtcctagttcaggccaaagctt 8888	catcatctttaggatcctcttctagacgagtaaagtaatcctcgttaccaagcaat-ggt 6837 	tactgtttcttgggtcctattcctttaaatgagagggtttcgttttacttcttctatct 6778 	caggataagaaggttcataaaatggtttctttattttgagaagaaaga	cgtgttacattgacacaaagagttaggtgtcaaaaggactaaatgaataacaatagctct 6658 	acctgtcaattatggatacacctcctatgacggtttccaaactttatcttgattcttat 6598	acactcgtgtgtgtctagtgggaaatcattgggctggagactgaacatcagaacacaaga 6538 	Cttcgtttttgatccgaagcaataacaaattgtcaaataccaaacacaagaattatgtaa 6478 	ttaaatgggctttctataaggcccaattatattacgattataacaaagtgacaactttta 6418 	ttgagtottttggacatttgtattggatgttgttgattattagtgtogacactattaaacc 6358 	ggtttgagaaaagggtttcgactttcgaaagtggacgatgtatatagattgggagctagg 6298 	gcccaatgatatataaaaatttggataaataatattattggatattcgtttttagttcg 6238 	aaagatgaaagtattttattotottotttttttttttgataattttaaatoattttttt 6178 

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
AUTHORS
                              δ
                                                           멍
                                                                            Qy
                                                                                                         밁
                                                                                                                         Qy
                                                                                                                                                   ᄝ
                                                                                                                                                                           Qy
                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
ORIGIN
              맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 4818; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                             2131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                               2251
                                                                                                                                                                              2191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TATA_signal
              301
                                                                                                         181
                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                  TTTATGGAACAAGAATAACAGATAGAAAACTATTTTGTTGTGGAATGGAAGTAGTAATA
                                                                                                                                                                  tttatggaacaagaaataacagatagaaaactattttgttgtggaatggaagtagtaata
                                                                                                                                                                                                      Direct Sub
Submitted
Tucson, AZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ect Submission
                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ed (22-JAN-1998) Plant
Az 85721, USA
                                                                                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                       VSRIL"
a 727
                                                                                                                                                                                                                                                                                                                                                                                          /translation="mfetehhtllpllllpsllsllflllkrrnrktrenlppgks
GWPFLGETIGYLKPYTATTLGDPMQGHVSKYGKIYRSHLFGEPTIVSADAGLNRFILQ
NEGRLFECSYPRSIGGILGKWSMLYLVGDMHRDMRSISLNFLSHARLRTILKDVERH
TLFYLDSWQONSIFSAQDEAKKFTFNLMAKHIMSMDFGEEETEQLKKEYVTFMKGVVS
APLNLDGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDH
VRKQRTDDDLLGWVLKHSNLSYEQIILDLISLLFAGHETSSVALALAIFELQACPKAV
EELREBHLEIARAKKELGESELMDDYKKMDFTQCVLMFTSVALALAIFELQACPKAV
EEKREHCHARAKKELGESELMDDYKKMDFTQCVLMFTSVALALAIFELGACPKAV
KYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGN
NYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIR
NYMPFGGGFRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Dilkes, B.P., Azpiroz, R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="steroid 22-alpha-hydroxylase"
/protein_id="AAC05093.1"
/db_xref="GI:2935342"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2502. 2554,2746. 2824,2931. 3040,3793. 4040,

/gene="NWF4"

/function="brassinosteroid biosynthetic enzyme"

/note="member of the cytochrome P450 superfamily;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="steroid 22-alpha-hydroxylase"
join(1133. 1353,1434. 1758,1844. 1996,2095. .
2562. 2654,2746. 2824,2931. 3040,3795. 4040)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="DWF4"
join(<1133. .1353,1434. .1758,1844. .1996,2095.
2562. .2654,2746. .2824,2931. .3040,3795. .4398)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /allele="dwf4-1;
990. .1055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="DWF4"
/note="dwarf4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 to 4818)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="DWF4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="taxon:3702"
/chromosome="III"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /strain="Ws-2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /organism="Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1. .4818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                            69.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cM from
                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                             Score 4818;
Pred. No. 0;
                                                                                                                                                                                                                                                                                                                                                                        888
                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dwf4-2;
                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                       1637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sciences, University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  dwf4-3;
                                                                                                                                                                                                                                                                                                                         DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Feldmann, K.A
                                                                                                                                                                                                                                                                                                                         12;
                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dwf4-4"
                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                         4818;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0f
                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Arizona,
                                                                                                                                                                                                                            2190
                                                                                                                              2310
                                                                                                                                                                              2250
                                                                                                        240
                                                                                                                                                       180
                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
Š
                                             Q
                                                                      밁
                                                                                         δÃ
                                                                                                                  밁
                                                                                                                                        δÃ
                                                                                                                                                                 g
                                                                                                                                                                                      Qy
                                                                                                                                                                                                               망
                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                    1261
                                                                                                                                                                                                               1141
                                                                                                                                                                                                                                                              1081
                                                                                                                                                                                                                                                                                      3151
                                                                                                                                                                                                                                                                                                             1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2491
                                                                                                                                                                   1201
                                                                                                                                                                                        3271
                                                                                                                                                                                                                                       3211
                                                                                                                                                                                                                                                                                                                                                                                  3031
                                                                                                                                                                                                                                                                                                                                                                                                                               2971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                            961
                                                                                                                                                                                                                                                                                                                                                                                                         901
                                                                                                                                                                                                                                                                                                                                                                                                                                                      841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    781
                                                                    ttaaaccgattgagaccgtaccggacttcctgggattctgctggagcatttatcaaaaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   acccctactcgtgagcccacccttttcccatatcctaagggtaattttggaaatcccaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aataactctgtctttgaccgcacgctcgtgtaggggtccttctgacattttcactgttct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggcaaaaaaaagacaatgccaaaagtctacgggtttgactgtccagttcggtaataatct
aagatatatagatcgaacttgtttggagaaccaacgatcgtatcagctgatgctggactt
                                   aaaaaaataaatcctctgtttttgaaatttgactaatgttgtttattttacaggtatggt
                                                                                                                              atccggttggccatttcttggtgaaaccatcggttatcttaaaccgtacaccgccacaac
                                                                                                                                                                                                                                                                                                                                                                                                                    aaagtaatgaacacggagaaacaaaagccatgaagctcattggttagtttaagcttaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttgtttttaatttaagagtttaataaataaaaggtattaaaaggagcataacgaggcaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tattagcacgaatgggtttattaatttaaaaaactcacaacttgatcagataaaatttcat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTAAACCGATTGAGACCGTACCGGACTTCCTGGGATTCTGCTGGAGCATTTATCAAAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCCCTACTCGTGAGCCCACCCTTTTCCCCATATCCTAAGGGTAATTTTTGGAAATCCCAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AATAACTCTGTCTTTGACCGCACGCTCGTGTAGGGGTCCTTCTGACATTTTCACTGTTCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGCAAAAAAAAGACAATGCCAAAAGTCTACGGGTTTGACTGTCCAGTTCGGTAATAATCT
                        AAAAAAATAAATCCTCTGTTTTTGAAAATTTGACTAATGTTGTTTATTTTACAGGTATGGT
                                                                                                                    ATCCGGTTGGCCATTTCTTGGTGAAACCATCGGTTATCTTAAACCGTACACCGCCACAAC
                                                                                                                                                                                                                                                                                                                                                                                                         AAAGTAATGAACACGGAGAAACAAAAGCCATGAAGCTCATTGGTTTAAGTTTAAGCTTAATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTGTTTTTAATTTAAGAGTTTAATAAATAAAAGTATTAAAAGGAGCATAACGAGGCAACA
                                                                      1380
                                                                                                                   1320
                                                                                                                                                                   1260
                                                                                                                                                                                                                                       3270
                                                                                                                                                                                                                                                              1140
                                                                                                                                                                                                                                                                                                             1080
                                                                                                                                                                                                                                                                                                                                   3150
                                                                                                                                                                                                                                                                                                                                                            1020
                                                                                                                                                                                                                                                                                                                                                                                  3090
                                                                                                                                                                                                                                                                                                                                                                                                                                 3030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                         960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             660
```

. Q D	Qy	, V	D Qy	Db Qy	Qy Db-	DB , Q9	Db Qy	Db Qy	Qy Db	ОУ	Db Qy	Db	Qу	Qу	, pb	gg Qg	ОУ	Db
TTATTATAGAATTATTCTATTAGAATATACGATGAAAAAAGTATGTAT	GAGCTTAGGGTAAGATAATTATAACAGCACAAGTTAATTACTACCAAATTGTTA, atataagttattatagaattattctattagaatatacgatgaaaaagtatgta:	471 gagcttagggtaagataattataacagcacaagttaattactaccaaattgttacgtatt 4	TCTGTAGCCATTGCTCTCCCTATCTTCTTCTTCTAACCTTCCCTAAAGCCTTTCTTT	4351 ttatcgacggagcaaattctcgatctcattcttagtttgttatttgccggacatgagact 4410 	4291 catgttaggaaacaaagaacagacgatgatcttttgggatgggttttgaaacattcgaat 4350 	4231 gaagatcaagaagaagaagaagtgaaaacagaggatgaagcagagatgagtaagagtgat 4290 	4171 gcaacgatattgaagttcattgagaggaaaattggaagaagaaaattggatatcaaggaa 4230 	4111 aggtttttaattttattttatgtgttaaataaatatctaaaatggttgtgtagtcacga 4170 	4051 toataaagotottoaggtacatttatttttttttgctgtaaagtcacaaactctcattat 4110 	3991 gtatgtaactttcatgaaaggagttgtctctgctcctctaaatctaccaggaactgctta 4050 	3931 ggcgaagcatataatgagtatggatcctggagaagaagaaacagagcaattaaagaaag	3871 tgaatctttagagtttctaacttttttttttttaattgaacagtttacgtttaatctaat 3930 	3811 caagacgaggccaaaaaggtttttatttttatcttttatttttgctaaatttttttgttta 3870 	3751 gttgagagacatactttgtttgttcttgattctttggcaacaaaactctattttctctgct 3810 	3691 agaagtatotogottaaottottaagtoaogcaogtottaagaactattotaottaaagat 3750 	3631 ggtgggattcttgggaaatggtcgatgcttgttcttgttggtgacatgcatagagatatg 3690 	3571 aatagattcatattacaaaacgaaggaaggctctttgaatgtagttatcctagaagtata 3630 	
																	· · · · · · · · · · · · · · · · · · ·	<del> </del>
3 5 U	Qy 56 Db 35	Qy 55 Db 34	Qy 54 Db 34	Qy 54 Db 33	ωω	ωυ	31	ωυ	י ש ני	ι ω υ	ı No Un	4 (4	28	4 8 27	- K) - &	. kı .c		Db 25
71 aataagataatatggtagtcatgatgttatagtgagtgag	4 1	S51 gttgactggttttaatacttagatttataactctattaatta	91 accacggetttgacggatctcacacgcccgatgacttgtacgtgcgttagattctgccac 5550 	31 gaccgttgatttattattagtcacggctttgatacaatttaagatttgacggacg	371 aattagtaggatggtatgtotttaatgaogtaggagotgcotaaatattottatatogt 5430 	1 ataartaaaaataagagagagagagacgtgttggtgtaagtgtacgtgaagacaatt 53 	51 tattattatotttcaagttagatottaacaogtcatggatcattgatcacaggaagcat 531 	91 CGTGATTTACCTATCTATAGATACTATACGAGAACTATTAATCTGGCAAAAACTTTTTAT 21 CGTGATTTACCTATAGATACTATAGGAGAACTATTAATCTGGCAAAAACTTTTTAT	31 gttaactatogaaaattagtgtatagtttttcatctattgatgatgaatagatacgtccta 519	71 tgaccaacctaatctctttaatccttggagatggcaacaggtaaataaa	1 coctagigggiggaaagigitacoggigatotcagcoglacatitggataattotcgita	ttggatg          TTGGATG	91 aaaggtaaaactttacgtacaaaatttttaaataatgaaatccggaatattgaaatctta 4 	331 cttcgattgggaaatgtaggttaggtttttgcattggcaaagcactcaaagatgtttgggtac 4890 	/1 atgatgaaaccaaaattaattgaattetetetetegtgtgtgtggaaggttataaatgaaact 4	actitacteatigus atgitactaceateateateateateateateateateateateateate		21 ATTGTCACTAATTTTATGTTTATTGATTTATACTTTTGAAGGAAG

```
밁
                                                                                                             Qy
                                                                                                                              В
                                                                                                                                               Š
                                                                                                                                                                  DЪ
                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                          65.
60.
60.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
           δõ
                            DЬ
                                             δÃ
                                                                B 64
                                                                                                                                                                                δõ
                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                     γQ
                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
밁
                                                                                                                                    4441
                                                                                                                                                                                     6451
                                                                                                                                                                                                                                                                                                                                                                            4021
                                                                                                                                                                                                                                                                                                                                                                                                                                               3901
                                                                                                                                                                   tacgattataacaaagtgacaacttttacttcgtttttgatccgaagcaataacaaattg
                                                                                                                                                                                                                                                                        gctggagactgaacatcagaacacaagaaacctgtcaattatggatacacctcctatgac
                                                                                                                                                                                                                                      tgattattagtgtcgacactattaaaccttaaatgggctttctataaggcccaattatat
                                                                                                                                                                                                                                                                                                                tattattggatattcgttttttagttcgggtttgagaaaagggtttcgactttcgaaagt
                                                                                                                                                                                                                                                                                                                                                                                    999tttctcgtattctgtaaaaaaaaaaaaagatgaaagtatttttattctcttctttt
                                                                                                                                                                                                                                                                                                                                                                                                                      cagaagatgatcaaccatttgcttttccttttgttgattttcctaacggttttgcctatta
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccaagttagaaatggcagtgtttattcatcatctagttcttaaattcaattcgggaattag
aaaggactaaatgaataacaatagctctcaggataagaaggttcataaaaatggtttcttt
                                                                                                         ggtttccaaactttatcttgattcttatcgtgttacattgacacaaagagttaggtgtca
                                                                                                                                    GCTGGAGACTGAACATCAGAACACAAGAAACCTGTCAATTATGGATACACCTCCTATGAC
                                                                                                                                                                                                                                                                                                         TATTATTGGATATTCGTTTTTTAGTTCGGGTTTGAGAAAAGGGTTTCGACTTTCGAAAGT
                                                                                                                                                                                                                                                                                                                                                                                                              CAGAAGATGATCAACCATTTGCTTTTCCTTTTGTTGATTTTCCTAACGGTTTGCCTATTA
                                                                                                                                                                                                                                                                                                                                                                                                                                               CCAAGTTAGAAATGGCAGTGTTTATTCATCATCTAGTTCTTAAATTCAATTGGGAATTAG
                                                                                                  GGTTTCCAAACTTTATCTTGATTCTTATCGTGTTACATTGACACAAAGAGTTAGGTGTCA
                                                                                                                                                                                                                                                                                                                                                                            GGGTTTCTCGTATTCTGTAAAAAAAAAAAAAAGTGAAAGTATTTTTATTCTCTTCTTTTT
                                                                 AAAGGACTAAATGAATAACAATAGCTCTCAGGATAAGAAGGTTCATAAAATGGTTTCTTT
                                                                                                                                                                                                                                                                                         6330
                                                                                                                                                                                    6510
                                                                                                                                                                                                                     6450
                                                                                                                                                                                                                                                                                                                                          4140
                                                                                                                                                                                                                                                                                                                                                           6210
                                                                                                                                                                                                                                                                                                                                                                                            6150
                                                                                                                                                                                                                                                                                                                                                                                                             4020
                                                                                                                                                                                                                                                                                                                                                                                                                             6090
                                                                                                                                                                                                                                                                                                                                                                                                                                                              6030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5910
                                                                                                                                                                                                     4380
                                                                                                                                                                                                                                       4320
                                                                                                                                                                                                                                                       6390
                                                                                                                                                                                                                                                                         4260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3780
                6810
                                                                                                  4560
                                                                                                                                   4500
                                                                                                                                                   6570
                                                                                                                                                                    4440
```

```
JOURNAL
REFERENCE
AUTHORS
TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACCESSION
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
ATF18022
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            · gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tagttcaggccaaagctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aagtaatcctcgttaccaagcaatggtctcatcttttgaagacaggtcttttccaagtcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TAGTTCAGGCCAAAGCTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAGTAATCCTCGTTACCAAGCAATGGTCTCATCTTTTGAAGACAGGTCTTTTCCAAGTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Submitted (13 APR-2000) MIPS, at the Max-Planck-Institut fuer Blochemie, Am Klopferspitz 18a, D-82152 Martinsried, FRG, E-mail: lencke@mips.biochem.mpg.de,mayer@mips.biochem.mpg.de Project Coordinator: Mike Bevan, Molecular Genetics Department, Cambridge Laboratory, John Innes Centre, Colney Lane, NR4 7UJ Norwich, UK, E-mail: michael.bevan@bbsrc.ac.uk
E-mail: michael.bevan@bbsrc.ac.uk
Information on performance of analysis and a more detailed annotation of this entry and other sequences of chromosomes 3, 4 and 5 can be viewed at: http://www.mips.biochem.mpg.de/proj/thal/
1. 100269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EU Arabidopsis sec
Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       thale cress.
Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rudd,S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bevan, M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Brassicales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          project)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (bases 1 to 100269) van, M., Murphy, G., Ridd, S., Lemcke, K. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (bases 1 to 100269)
                                                                                                                                                                                                                                                                                                                                                                                                     /gene="F18022_10"
/gene="F1802
/product="protoporphyrinogen oxidase-like protein"
/product="protoporphyrinogen oxidase-like protein"
/protein_id="CAB87761.1"
/protein_id="CAB87761.1"
/db_xref="GI:7573447"
/translation="MASGAVADHQIEAVSGKRVAVVGAGVSGLAAAYKLKSRGLNVTV
FEADGRVGGKLRSVMOMGLINDEGANTMTEABEPUSSLLDDLGLREKQOFPISOKKRY
IVRNGVPVMLPTNPIELVTSSVLSTOSKFOILLEPFLMKKKSSKVSDASAEESVSEFF
ORHFGQDVVDVLIDPFVGGTSAADPDSLSMKHSFPDLMNSFGSIIVGAIRTKEAAKGG
KRSDTKSSPGTKKGSRGSFSFKGGMQILPDTLCKSLSHDEINLDSKVLSLSVSGSRQ
ENWSLSCVSHNETQRQNPHYDAAPLCNVKEMKVMKGGPPDLNFLPEINYMPLSVSLIT
TFTKEKVKRPLEGGFVLLPSKEQKHGFKTLGTLFSSMMFPDRSPSDVHILTTFFIGGSR
NGELAKASTDELKQVVTSDLQRLLGVEGEPVSVNHYYMRKAFPLYDSSYDSVMEAIDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="taxon:3702"
/chromosome="5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /organism="Arabidopsis
/variety="Columbia"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             100269 bp
s thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GI:7573446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sequencing, project.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ridley, P., Hudson, S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mayer, K.F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    thaliana"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 clone F18022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             more detailed
  of chromosomes 3, 4
hem.mpg.de/proj/thal/.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Spermatophyta;
e: eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (ESSA)
```

intron	intron	intron	exon	intron	intron exon	• exon	intron	exon	intron	exon	intron	exon	intron	exon	intron	exon	intron	exon	intron	exon	intron	exon	intron	exon	intron	
/number=15 complement(55325639) /number=15	<pre>complement(53405465) /number=14 complement(54665531) /gene="F18022_10"</pre>	<pre>compLement(51815288)   /number=13   compLement(52895339)   /gene="F18022_10"   /number=14</pre>	*.	/gene="F18022_10" /number=12 complement(49235123) /number=12	(4760.	complement(47234759) /gene="F18022_10" /number=11	complement(45544722) /Dumber=10	complement(44884553) /gene-"F18022_10" /pumber=10	/number=9 complement(43944487) /number=9	complement(43644393) /gene="F18022_10"	complement(40064363) /number=8	complement(38714005) /gene="F18022_10"	/number=/ complement(37443870) /number=7	Complement (35823743)  complement (35823743)  /gene="F18022_10"	/number=6 complement(34943581)	// // // // // // // // // // // // //	/number=5 complement(32183418)	complement(30943217) /gene="F18022_10"	/number=4 complement(30053093) /number=4	complement(28963004) complement(28963004) yeane-"F18022_10"	/number=3 complement(27742895) /number=3	complement(26992773) /gene-"F18022_10"	complement(26032698) /number=2	complement(24962602) /gene="F18022_10"	MENDLPGFTYAGNHRGGLSVGKSIASGCKAADLVISYLESCSNDKKPNDSL" complement(23772495) /number=1	
Qy 3493 ttattttacaggtatggtaagatatatatagatcgaacttgtttggagaaccaacgatcgta 3552	Query Match 1.9%; Score 134; DB 13; Length 100269; Best Local Similarity 53.5%; Pred. No. 1.7e-99; Matches 308; Conservative 0; Mismatches 260; Indels 8; Gaps 1;	s and ein"	1607116318) /gene="F18022_30" /note="similarity to various predicted proteins from	.15145,1533815543,15644.	<pre>complement(1497315145) /gene="F18022_30" /number=1</pre>	gene /number=3 .  /number=3 .  1497316318  /gene="F18022_30"	exon 12884.14525 /gene="F18022 20"	intron 12890. 12983 /gene="F8022_20"	exon 12/52. 12889 //gene="F18022_20" //numher=7	/gene="F /number=	CARMYRGIRLYTRETICGRTQTQN"  intron 12653, 12751	AARGDVKAVKLISKKGYSLIP PODGSTYP LILLAKREIDER HEIDKONKENOK. TALIK AARGDVKAVKLISKKGYSLIP PODGSTYP LILLAKREIGHGHKEST LISKGKSKISKOLKAKNG RGEKLLDLATGDAEKVIRKELSRRPVIEGSSVMKHTKGGKGKKHGKGLRHLESGCVLS RGEKLTDLATGDAEKVIRKELSRRPVIEGSSVMKHTKGGKGKKHGKGLRHLESGCVLS	LISLKHANDAGERAVITARIO OF THE THE TOTAL THE TOT	RVGAGVAEBY PLIMVACJALVAALVANLUKA VALLUKAVA KILLIMVAKJAKILLIKOG SVELILIKUG SVELILIKOG SVE	/db_xref="GI:7573448" /translation="MGTDLIRPQVAVHALATACCRGFVDVVGTLLKCGVDANSTDRLL	/product="ankyrin-like protein" /protein_id="cAB87762.1"	/note="similarity to 270 kDa ankyrin G isoform, Rattus norvegicus, EMBL:AF102552"	14525)	gene 12557. 14525	exon 1257-: 1-20 /gene="F18022_20"	complement(b091b118) // (1909 - 1900 - 19	on complement(5982. /number=17	/number=17	on complement(5776 /number=16	exon complement(56405775) /gene="18022_10" /number=16	

```
JOURNAL REFERENCE
                                                                                                                                                                                                                                                                                                                                            REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT
AC005504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ø.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                         COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                       ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Locus
                                                                                                                                                                                                                                                      AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                          ORGANISA
                                                                                                                                                                                                                                      JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4033
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agttatcctagaagtataggtgggattcttgggaaatggtcgatgcttgttcttgttggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tctaccaggaactgcttatcataaagctcttcaggt 4068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtttacgtttaatctaatggcgaagcatataatgagtatggatcctggagaagaagaaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TATAATCAATATTGTT-----ATAATTCTGATATCTTTGTTGCGGTTGAATCATACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAAATTCACAGGAAACTAAAAAATGTTATTATTAGCTTCATCAATCTCACAAAGTCGAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GATTATCCAAAAGCGATGCATGACATTCTCGGCAAATATTCCCTTCTATTAGCCACCGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCTTCCAGGAACGGGTTATACAAACGCAATTAAGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agagcaattaaagaagagtatgtaactttcatgaaaggagttgtctctgctctctaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTTTACTCTCAGTGTTATGGTAAACCAACTCTTGAGCATCAAGCCAGAAGACCCAGCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCTGACTTTCTTCACTGCGCAGAGAACCTCTCTATCTCGATACTAAAGTCATGGAAAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACTTTATGTATTGCAAGATTTTTTATCTTATATGAAAGGGTTTATCTCCTTACCAATACC
                                                                                                                                                                          94304, USA
On Apr 2, 1
* NOTE: Thi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AC005504 104992 bp DNA
Plasmodium falciparum chromosome
***, 3 unordered ricer-
                                                                                                                                                                                                                 Hyman, R.W., Qin,F., Fung,E.L., Conway,A.B. and Davis,R.W. Direct Submission
Submitted (21-AUG-1998) Stanford DNA Sequencing and Technology Center, Stanford University, 855 California Avenue, Palo Alto,
                                                                                                                                                                                                                                                                                 Unpublished 2 (bases 1
                                                                                                                                                                                                                                                                                                                             Hyman, R.W., Fung, E.L., and Davis, R.W.
                                                                                                                                                                                                                                                                                                                                                       Plasmodium falciparum
Eukaryota; Alveolata; Apicomplexa; Haemosporida; Plasmodium.
1 (bases 1 to 104992)
                                                                                                                                                                                                                                                                                                                                                                                                                                      AC005504
AC005504.3 GI:4558584
                                                                                                                                                                                                                                                                                                               Plasmodium falciparum
                                                                                                                                                                                                                                                                                                                                                                                                       malaria parasite P. falciparum
                                                              as soon as it
be preserved.
                                                                                          arbitrary. Gaps between the contigs are represented as runs of N, but the exact sizes of the gaps are unknown. This record will be updated with the finished sequence
                                                                                                                                       Apr 2, 1999 this sequence version replaced gi:4337172. NOTE: This is a 'working draft' sequence. It currently consists of 3 contigs. The true order of the pieces is not known and their order in this sequence record is
                                                                                                                                                                                                                                                                                 (bases 1 to 104992)
   58643
58843
91012
                                                                                                                                                                                                                                                                                                                                                                                                                         HTGS_PHASE1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unordered
                                                                             it is available
 58642:
58842:
91011:
91211:
contig of 58642 bp in
gap of unknown length
contig of 32169 bp in
gap of unknown length
                                                                                                                                                                                                                                                                                                               3D7
                                                                                                                                                                                                                                                                                                                                            Qin, F., Tamaki, T.,
                                                                                                                                                                                                                                                                                                                chromosome
                                                                              and
                                                                              the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               63364
                                                                             accession
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HTG 01-APR-1999
SEQUENCING IN PROGRESS
                                                                                                                                                                                                                                                                                                                                            Kurdi, O.B.,
                 Length
                                              length
                                                                             number
                                                                                                                                                                                                                                                                                                                                            Conway, A.B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           63096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      63036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            63328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  63208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             63156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62916
                                                                                                                                                                                                                    CA
```

```
밁
                                                                                                                                                             QΥ
                                                                                                                                                                                밁
                                                                                                                                                                                                Ş
                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                     ρ
                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
밁
               Qy
                                 DЬ
                                                   Ş
                                                                     Д
                                                                                     δÃ
                                                                                                                         Qγ
                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 1041;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                       72869
                                                                                                                                                                                                                                                                                                                                                                 72689
                                                                                                                                                                                                                                                                                                                                                                                                     72629
                                                                                                         73106
                                                                                                                                             73049
                                                                                                                                                                                                                                                                                          72809
                                                                                                                                                                                                                                                                                                                                                                                                                                        72569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            72509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               72449
73286
                                                                                                                                                                                72989
                                                                                                                                                                                                                    72929
                                                                                                                                                                                                                                                                                                                              72749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                               405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             167
                 945
                                                                                       825
                                                                                                                                                             705
                                                                                                                                                                                                  645
                                                                                                                                                                                                                                     585
                                                                                                                                                                                                                                                                         525
                                                                                                                                                                                                                                                                                                            465
                                                                                                                                                                                                                                                                                                                                                                                    346
                                                                                                                                                                                                                                                                                                                                                                                                                      286
                                                                                                                                                                                                                                                                                                                                                                                                                                                          227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         108 ataattaaatattaaaattcatttaaaatatttaca-agtaattaattatctttacattg 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tattgttataacaaaatatctatctttggtatatgagaaaatatggagtttggaatttat 226
                                                                                                                                                                                                                                                                                                                             aaaacaattgtctgggaccattttgaataaactttttctcaaacattacgggacactgga 1004
                                            tggaataatggtccctgccagctttctctcacaatcaatatcgaccctattttggattttc
                                                                                                                                                                                          tgacccatggagtatgtgaataattatcaaagagaataagagatgacaaccaaaaggttg
                                                                                                                                                                                                                   cagcaaattattaacaagagtattgagaaaaaaccgaaaataagaaaagggaaagagtag 644
                                                                                                                                                                                                                                                                  acgagtgtgaatatccgtttatcgatcactccaatcatgattatgattcttgtgctaatc
                                                                                                                                                                                                                                                                                          tttttggttctggattaggtttatttgatcataattacatgcatcatttctttgattact 464
                                                                                                                                                                                                                                                                                                                                                                                                    AATTATTTAATAAATAAAAATAATAATAAATTTAAATTAATAATTAAATTAAATTCATAAT 72688
                                                                                                                                                                                                                                                                                                                                                                                                                                        aataataaaggaaataatcgattccatttggttggat-tacacagttaagtttttgtgtt 285
                                  tggatattcgttaaaatttgcgataacgattgtgaaaaatattttatttgttagctgatc 824
                                                                                                                                           44286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Plasmodium
/db_xref="taxon:5833"
/chromosome="12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9326 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .104992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              104992: contig of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0; Mismatches 1248;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9564 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         41411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 talciparum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .2; DB 6
2.2e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (+
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     104992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
73343
                                                    944
                                                                                       884
                                                                                                                                                             764
                                                                                                                                                                                73048
                                                                                                                                                                                                  704
                                                                                                                                                                                                                                                                        584
                                                                                                                                                                                                                                                                                                           524
                                                                                                                                                                                                                                                                                                                                                                 72748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12;
```

Ş

밁 Q В Ş 밁 Š

```
73404
74063
                                                                                                                                                                                                                                                                                                                                                                                                            74003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               73943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                73883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  73823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           73464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1005 ctcgacccttaaaaatacgattttacagcgtcactagttgagattactagcataaagcata 1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tttcctatgttcttaaaatattttttttttatatttagttataaaatacattatgaaccaat 2060
                                                                 aatttttgaaaaatgttataatttctaacaatattattaaaatatgatgcctataatgta 2000
                                                                                                                                    aattcaatgctactatcaatagaagaaacagctgagtattacattttaatttaaagacaa 1940
                                                                                                                                                                                                     TAATTTAATTAATAATTATATAATATTTATATTATTTGTTTAATATTTAATTACTATT
                                                                                                                                                                                                                                                                                                    gaggtaaaaa--aagttttgtcttattttcgcgatgcatgaaggataaacctaatgactt 1763
                                                                                                                                                                                                                                                                                                                                                                                                          acatactttggatgtttaaacttaatcttgtttcttcctacggtataaatattaatcatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tgtaacatta-----caatatttatattagatactagtatgtgattattccaaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TATATATATTAATTAATTAATTAATTATGTTTATATTTTAATTTAAAATAAATATATTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gctttctttaatgcatctttaacatatttattgttagttggaatttaataagagcgaact 1595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cttttgggttacagtttcgaagtcctctacaagcgtgtaaccatctgcaactattaaatt 1535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acaagaaaaaaagaaaacgatttttcttggattccattcaatgatctaaaatgcatagat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gaaaattttggaattaccggttgttatgtaaatatagatttagtggtaaacaaatatgtt 1184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aaggacccgttcaagctatttatacaaagttacaaactgaatatagcttgaaatccttta 1124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                taacatatccatatatgggtatgctatacct-----ttcacgtatgctatactaga 1295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1415
                                                                  74362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            74002
                                                                                                                                                                                                                                                                        74182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  73762
```

밁 Š В Ş 밁 80 밁 QΥ . 문 δ 밁 Ş В Ş 밁 Ş 밁 Š рь 20 B Š 망 Ş 밁

밁 Ş 밁 Ş

Query Match
Best Local Similarity
Matches 1041; Conserv

Conservative

1.98;

Score 133.2; DB 60; Pred. No. 2.1e-09; 0; Mismatches 1248;

Indels

Gaps

12;

Length 169546;

```
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
 BASE COUNT
                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                           COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AC004157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                    JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     74721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  74543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2061 aatagttggtgaattcaaatatctccattaat----attttttgaaatctacaaattatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aagtatgttatctagtaggtgtaattaataatgcatggtgcgattcagaattggggacaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TATAATTGAATATTATTTTATTTTAATTAATTATAATATATAATTAATTTAATTATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tggaagtagtaatacattaagcaaattttaaaaaattatatatgcctatacgcgctca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ccaaatttttttttttttatggaacaagaaataacagatagaaaactattttgttgtggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aatatttagtcaataacaatgcatagaaagttccaaaaaaattttgttaacagaaactt 2176
                                                                                                                                                                                                                                                                                         94304, USA
On Aug 12, 2000 this sequence version replaced g1:8810447
* NOTE: This is a 'working draft' sequence. It currently
* consists of 2 contigs. The true order of the pieces
* is not known and their order in this sequence record is
                                                                                                                                                                                                                                                                                                                                                                                             Submitted (19-FEB-1998) Stanford DNA Sequencing and Technology Center, Stanford University, 855 California Avenue, Palo Alto,
                                                                                                                                                                                                                                                                                                                                                                                                                                2 (bases 1 to 169546)
Hyman, R.W., Qin, F., Fung, E.L., Conway, A.B.
Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hyman, R.W., Fung, E.L., Qin, F., Rowley, D., Kurdi, O.B., Conway, A.B. and Davis, R.W. Plasmodium falciparum 3D7 chromosome 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AC004157 169546 bp DNA HT Plasmodium falciparum chromosome 12 clone PROCRESS ***, 2 unordered pieces.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota; Alveolata; Apicomplexa; Haemosporida; 1 (bases 1 to 169546)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Plasmodium falciparum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           malaria parasite P. falciparum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HTG; HTGS_PHASE1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AC004157.8 GI:9797712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Unpublished
                                                                                                                                                                                                    arbitrary. Gaps between the contigs are represented as runs of N, but the exact sizes of the gaps are unknown. This record will be updated with the finished sequence as soon as it is available and the accession number will be preserved.
/clone="PFYAC293"
/clone="3D7"
a 15381 c 15705;
                                                       /db_xref="taxon:5833"
/chromosome="12"
                                                                                          /organism-"Plasmodium
                                                                                                                1. .169546
                                                                                                                             Location/Qualifiers
                                                                                                                                                 23466: contig of 23466 bp in length
23666: gap of unknown length
169546: contig of 145880 bp in lengt
g
68389
                                                                                            falciparum"
t
200 others
                                                                                                                                                 in length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Мао, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3D7,
                                                                                                                                                                                                                                                                                                                                                                                                                                                        and Davis, R.W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Plasmodium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tamaki,T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12-AUG-2000
SEQUENCING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       74662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                74602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Z
                                                                                                                                                                                                                                                                                                                                                                                                 Ç
```

8 8	108 84033	ataattaaatattaaaattcatttaaaaatatttaca-agtaattaattatctttacattg 166	
ğ ¾	167 84093	tattgttataacaaaatatctatctttggtatatgagaaaatatggagtttggaatttat 226 	
₽ ₹	227 84153	ttaagtttttgt          ATAAATAATTAA	
, <u>A</u> ⊼	286 84213	aatcaaaaagagt          AATAAATTTAAAT	
8 8	346 84273	tcgttatgacccccaaaaaaaaaaaaaaaaaacaaaca-aacaaacccccc	
₽ ₹.	405 84333	tttttggttotggattaggtttatttgatcataattacatgoatcatttctttgattact 464	
8 8	465 84393	aatt !    AATT	
₽ ₹	525 84453	acgagtgtgaatatccgtttatcgatcactccaatcatgattatgattcttgtgctaatc 584	
₽ ₹	585 84513	cagcaaattattaacaagagtattgagaaaaaaccgaaaataagaaaagggaaagagtag 644 	
₽ ₹	645 84573	tyacccatgyaytatytyaataattatcaaayayaataayayatyacaaccaaaayytty 704	
₽ ¥	705 84633	tggaataatggtccctgccagctttctctcacaatcaatatcgaccctatttggattttc 764	
₽ ₹	765 84690	tggatattcgttaaaatttgcgataacgattgtgaaaaatattttatttgttagctgatc 824 	
₽ ₹	825 84750	tcttctgtttaaagcat 	
₽ ₹	885 84810	tttgtttcgtttctctttaactatatattatcgcggatatatgataacaatgatatatcac 944	
₽ ₹	945 84870	aaaacaattgtctgggaccattttgaataaactttttctcaaacattacgggacactgga 1004	
8 8	1005 84928	ctcgacccttaaaatacgattttacagcgtcactagttgagattactagcataaagcata 1064	
8 8	1065 84988	aaggacccgttcaagctatttatacaaagttacaaactgaatatagcttgaaatccttta 1124 	
გ ჯ	1125 85048	9aaaattttggaattaccggttgttatgtaaatatagatttagtggtaaacaaatatgtt 1184 	

ttaaaaaattatataagcctatacgcgctca 2296	aaa	2237	Qy
TTAATTAATAATAATTTAATTTAATTAAA 86186	7 ATTATTATTTTATTTTATTTTAAATTAATTAATT	86127	ДD
agatagaaaactattttgttgtg	tttttttttatggaacaagaaataac	2177	Qy
TAATTTAATTAAATATATATATAATAATAATAAT	7 TATTTTAAATTAATTAAATAATAATT	86067	DЬ
laaaattttgtt	ttagtcaataacaatgcataga	2117	Qy
		86007	Db
atttttgaaatctacaaatta	l aatagttggtgaattcaaatatctccattaat	2061	Оу
arattagraataaaracarrargaaccaar 2000 	1 LLCCCAEGUECECAAAALAEUEEEEEEACAA 	85947	Db QY
TTATAATGTTTATTTATA 859	7 TTATTAATAATTATATATATATTTATTAAATTA	85887	) D
tatgatgcctataatgta 2000 	1 aattittgaaaaatgttataattictaacaatattattaaaa	· O	Qy
GAAATTATTAAAAAATATATGTATTTAAAT 85886	7 ATTATAATGTAATAAAAATAAATTAAGAAATT	85827	망
agctgagtattacatttaatttaaagac	tcaatgctactatcaatagaagaaa	1881	Qy
AAATTAATTTAATTATATTTTTTTAAATAAAAAATATAT 85826	 ATTTAATTATT	85767	DЬ
attaaa	tgacagcctctac	1824	Qy
G-	   FATTATATATAT	85707	DЬ
ttttgt	aatttttgaaaatgtaacccttttac	1764	Qy
ATATA	AATTTATATTTTAAATTAATTATTAATATATA	85647	Db
atgcatgaaggataaacctaatgact	gaggtaaaaaaagttttgtcttattttcgc	1706	Qy
AATTAAATAAAAGTATAAAATTATCTTTCTT 85646	AACATAAAATTATTATTACTATATTTAATT	85587	Db
cttcctacggtataaatattaatca	acatactttggatgtttaaacttaatcttgttt	1646	Qy
	TATAAAATTAATTATTAAATAAATAAAAAA	85527	Db
gatactagtatgtgattattco	tgtaacattacaatatttatatt	1596	Qy
AATTAATTAATTATATGTTTATATTTTAATTTAAAATAAATATATTT 85526	TATATATATATTT	85467	Db
.2	gcttctttaatg	1536	Qy
TAATTAAAATGTGAAATATATTATTATTATATAAAAAAAA	AAATGGTTATTTTATTT	85407	Db
caagogtgtaacoatotgcaactattaaatt 1535	cttttgggttacagtttc	1476	Qy
TTAATTAAT 854	T.	85347	Db
tgcata	acaagaaaaa	1416	Qy
ATATATAATTAATTAATAAATGTTTTA 853	TTAAT-TAATTTAAGATAATATATAATATTAT	85288	DЬ
attottggttggtcaacaataaaaacaaa	ggaccgtatgttacgatcactgcaaatatcat	1356	Qy
ATAATTAATATAATAAATAATTATTATATTAAAATAATTAAAA	AAATAAAATATAC	85228	Db
aatgaaattcacacgcgtggtaataattatg 1355	gactaaagaatag	1296	Qy
AAATAAATAATAAATATTAAACAA	TATAATAATTAATTAAATAATAATATATAAAT	85168	Db
tttcacgtatgctatac	taacatatccatatatgggtatgctatacct	1245	Qy
AATAATTAAATATAA	AATAAATAAACAATAATTAAATTAATAATATATATATAATA	85108	Db 43
aaactta	aatcaa	1185	γQ

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AC005504/c
LOCUS
В
                          Ş
                                                          В
                                                                                    Š
                                                                                                                    В
                                                                                                                                                                                                                                                        BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DEFINITION
                                                                                                                                                                              Query Match
Best Local s
Matches 972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
 74619
                                                                                                                     74739
                                                             74679
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              86305
                                                                                                                                                                                                                                                                                                                                 source
                                                                                       166
gtattgttataacaaaatatctatctttggtatatgagaaaatatggagtttggaattta 225
                                                                                                                                              taataataaaggaaataatcgattccatttggttggattacacagttaagtttttgtgtt 285
                                                        al Similarity
972; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Direct Submission
Submitted (21-AUG-1998) Stanford DNA Sequencing and Technology
Center, Stanford University, 855 California Avenue, Palo Alto,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hyman, R.W., Fung, E.L., Qin, F., Tamaki, T., and Davis, R.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HTG;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AC005504 104992 bp DNA Plasmodium falciparum chromosome 12, ***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          94304, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 (bases 1 to 104992)
Hyman, R.W., Oin, F., Fung, E.L., Conway, A.B. and Davis, R.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Plasmodium falciparum 3D7 chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Plasmodium falciparum Eukaryota; Alveolata; Apicomplexa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      malaria parasite P. falciparum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AC005504
AC005504.3 GI:4558584
                                                                                                                                                                                                                                                                                                                                                                                                                                      Dn Apr 2, 1999 this sequence version replaced gi:4337172.

NOTE: This is a 'working draft' sequence. It currently consists of 3 contigs. The true order of the pieces is not known and their order in this sequence record is rankitrary. Gaps between the contigs are represented as runs of N, but the exact sizes of the gaps are unknown. This record will be updated with the finished sequence as soon as it is available and the accession number will be preserved.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 104992)
                                                                                                                                                                                                                                                                                                                                                              58643
58843
91012
91212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HTGS_PHASE1.
                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    unordered
                                                                                                                                                                                                                                                                                    /organism="Plasmodium falciparum"
/db_xref="taxon:5833"
/chromosome="12"
                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                          1.9%;
                                                                                                                                                                                                                                                                       9326 c
                                                                                                                                                                                                                                                                                                                                 .10499
                                                                                                                                                                                                                                                                                                                                                         58642: contig of 58642 bp in
58842: gap of unknown length
91011: contig of 32169 bp in
91211: gap of unknown length
104992: contig of 13781 bp in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 pieces.
                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                      9564 g
                                                                                                                                                                              Score 130.8; DB 60;
Pred. No. 4.6e-09;
0; Mismatches 1172;
                                                                                                                                                                                                                                                                       41411
                                                                                                                                                                                                                                                                       ۲t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Haemosporida; Plasmodium
                                                                                                                                                                                                          DB 60;
                                                                                                                                                                                                                                                                      405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HTG 01-APR-1999
SEQUENCING IN PROGRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kurdi, O.B., Conway, A.B
                                                                                                                                                                                                                                                                                                                                                                                        length
                                                                                                                                                                                                                                                                                                                                                                                                                        length
                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                              length
                                                                                                                                                                                                          Length 104992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2404
                                                                                                                                                                            48; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IN PROGRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              86246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CA
                                                                                                                                                                              9
```

```
Š
                                                 Ş
                                                                                                      Š
                                                                                                                                  밁
                                                                                                                                                          Ş
                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                           밁
                                                                             B
                                                                                                                                                                                     В
                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                            뮹
                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                      73979
                                                                                                                                                                                                                                                                                                                                                 73919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              74200 TAATAATTAAATATTTAATAGTAATTAAATATTAAACAAATAATATAAATATTATATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                      74038 TTTAATTAAATATATAGTAATAAATAATTTTATGTTATT-TATTATAATAATAATTATTA 73980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  74440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     74499
 1349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TAATTTAAAATATAAATTAAGA-------AAGATAATTTTATACTTTTA 74039
gagtagtgacccatggagtatgtgaataattatcaaagagaataagagatgacaaccaaa
                                                agactaaagaa-----tagttatgtgatgtcgataaatgaaattcacacgcgtggtaat 1348
                                                                                                                                                tttctttttgtttcgtttctcttaactatattatcgcggatatatgataacaatgata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ctgatctcaatattatgttccaggtatttgcataatcttctgtttaaagcatattttgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ctaatccagcaaattattaacaagagtattgagaaaaaccggaaaataagaaaagggaaa
                          taagagaagttaacatatccatatatgggtatgctatacctttcacgtatgctatactag
                                                                                                                                 cctttagaaaattttggaattaccggttgttatgtaaatatagatttagtggtaaacaaa 1178
                                                                                                                                                                                                                                         agcataaaggacccgttcaagctatttatacaaagttacaaactgaatatagcttgaaat 1118
                                                                                                                                                                                                                                                                                            ATATTTCACATTTAATTAAAATAAAAAAAAAAATAACCATTTAATTAACTTAATTAATATAT
                                                                                                                                                                                                                                                                                                          actggactcgaccttaaaatacgattttacagcgtcactagttgagattactagcataa
                                                                                                                                                                                                                                                                                                                                               tatcacaaaacaattgtctgggaccattttgaataaactttttctcaaacattacgggac
                                                                                                                                                                                                                                                                                                                                                                                                      attttctggatattcgttaaaatttgcgataacgattgtgaaaaatattttatttgttag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTATTACATTATATATATATATTTTTTTTAAAAAAAATATAAATAAATAAATTAAATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tgaagattttcttaccaattaaaaatttcgaattcatatctcttgattattaaattaa---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ttttggttctggattaggtttattttgatcataattacatgcatcatttcttttgattacta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAAATAAAATAATAATATTATTATTATATATATATTAATTAAATTAAATTTAATTAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -atacgagtgtgaatatccgtttatcgatcactccaatcatgattatgattcttgtg
 1408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    74201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            74321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           465
                                                                                                                                  73620
                                                                                                                                                                                                                                                                                                                                                                                                    73920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             74081
```

```
ACCESSION
VERSION
KEYWORDS
                                                                           RESULT 7
AC004157/c
LOCUS
                                                                                                                                                               Q
                                                                                                                                                                                            В
                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                               д.
                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ζ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                . 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                          밁
 SOURCE
                                                               DEFINITION
                                                                                                                                          72610 TATATATATTTAATTTTAATATTTTTAAA 72579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                73199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      73379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         73439
                                                                                                                                                                                                                                                                                                aaaaatgttataatttctaaccaatattattaaaatatgatgcctataatgtatttcctat 2008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gtaaaaaaagttttgtcttattttcgcgatgcatgaaggataaacctaatgactttaatt 1768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tactttggatgtttaaacttaatcttgtttcttcctacggtataaatattaatcatcgag 1708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcgaacttgtaacattacaatatttatattagatactagtatgtgattattccaaataca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aacaaaaacaagaaaaaaaacgatttttctttggatttccattcaatgatctaaaatg 1468
                                                                                                                                                                                                              ttttatggaacaagaaataacagatagaaaactattttgttgtggaatggaagtagtaa
                                                                                                                                                                                                                                                                                                                                                 gttcttaaaatatttttttttatatttagttataaatacattatgaaccaataatagttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                       gacagcctctacaactgtgatagtcaatttttttctgcaaatattaaattaggaattcaat 1888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttttgaaaatgtaacccttttactcatagattaattaccgtatgtttttgttgccataat 1828
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ttaaattgctttctttaatgcatctttaacatatttattgttagttggaatttaataaga 1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          catagatcttttgggttacagtttcgaagtcctctacaagcgtgtaaccatctgcaacta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tatacattaagcaaattttaaaaaaattatata
                                                                                                                                                                                            ATTTATTATTAATTCATATTTATTAATTAATGTGTATTATGAATTTAATTATATTAAT
                                                                                                                                                                                                                                                                    ataacaatgcatagaaagttccaaaaaaaattttgttaacagaaacttccaaattttttt 2188
                                                                                                                                                                                                                                                                                                                                                                                                     TATAAATTATTAATTAATTAATTTATTTATTTATTTACTAAATATAAATTAATTAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATATATTTAATTTAATTATATATATATTTAATTTAATTGTATATATATTTAATTTATT 73260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AC004157
AC004157.8 GI:9797712
HTG: HTGS_PHASE1.
                                               AC004157 169546 bp DNA
Plasmodium falciparum chromosome 12
PROGRESS ***, 2 unordered pieces.
parasite P. falciparum.
                                                                                                                                                                  2280
                                                             clone
                                                               3D7,
                                                                * * *
                                                             12-AUG-2000
* SEQUENCING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1648
                                                                                                                                                                                                                    2248
                                                                                                                                                                                                                                                                                                                       2128
                                                                                                                                                                                                                                                                                                                                                                            2068
                                                                                                                                                                                                                                                                                                                                                                                                                                                       72905
                                                                                                                                                                                                                                                                                                                                                                                                    72845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             73080
```

```
REFERENCE
AUTHORS
TITLE
                                                         Ş
                                                                                        밁
                                                                                                                    Ş
                                                                                                                                                 밁
                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QУ
Š
                               밁
                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
                                                                                                                                                                                                            86083
                                                                                                                                                                                                                                                                       86143
                               85904
                                                                                                                                                   86024
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 106
                                                                                                                                                                                                                                        346
                                                                                                                                                                                                                                                                                                                                                           226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            y Match 1.9%;
Local Similarity 44.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtattgttataacaaaatatctatctttggtatatgagaaaatatggagtttggaattta 225
ctaatccagcaaattattaacaagagtattgagaaaaaaaccgaaaaataagaaaaagggaaa 638
                               tgaagattttcttaccaattaaaatttcgaattcatatctcttgattattaaattaa---
                                                                                                                                                   ttttggttctggattaggtttatttgatcataattacatgcatcatttctttgattacta 465
                                                                                                                                                                                                            taataataaaggaaataatcgattccatttggttggattacacagttaagtttttgtgtt 285
                                                                                                                                                                                                                                                                                                                                                                                          972;
                                                       ----atacgagtgtgaatatccgtttatcgatcactccaatcatgattatgattcttgtg 578
                                                                                        Plasmodium falciparum
Eukaryota; Alveolata; Apicomplexa; Haemosporida;
1 (bases 1 to 169546)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      on Aug 12, 2000 this sequence version replaced gi:8810447.

* NOTE: This is a 'working draft' sequence. It currently

* consists of 2 contigs. The true order of the pieces

* is not known and their order in this sequence record is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (19-FEB-1998) Stanford DNA Sequencing and Technology Center, Stanford University, 855 California Avenue, Palo Alto,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hyman, R.W., Fung, E.L., Qin, F., Kurdi, O.B., Conway, A.B. and Dav
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94304,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hyman, R.W., Qin, F., Fung, E.L., Conway, A.B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Plasmodium falciparum 3D7 chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              arbitrary. Gaps between the contigs are represented as runs of N, but the exact sizes of the gaps are unknown. This record will be updated with the finished sequence as soon as it is available and the accession number will
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69871
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                be preserved.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (bases 1 to 169546)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23467
23667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /clone="PFYAC293"
/clone="3D7"
15381 c 15705 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Plasmodium
/db_xref="taxon:5833"
/chromosome="12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .169546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23466: contig of 23466 bp in 1
23666: gap of unknown length
169546: contig of 145880 bp in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0; Mismatches 1172;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 130.8; DB (
Pred. No. 4.3e-09)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qin, F., Rowley, D., and Davis, R.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     68389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             falciparum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mao, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Davis, R.W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Plasmodium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Tamaki,T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            169546;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                     522
                                                                                                                                                                                                                                                                                                   345
                                                                                                                                                                                                                                                                                                                                                                                          86204
                                                                                        85905
                                                                                                                                                   85965
                                                                                                                                                                                                              86025
                                                                                                                                                                                                                                                                                                                                 86144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9;
```

```
٠
ک
         Š
                                  В
                                                      Ş
                                                                              ₽
                                                                                                  δÃ
                                                                                                                           뭐
                                                                                                                                             QΥ
                                                                                                                                                                     밁
                                                                                                                                                                                          õ
                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                              õ
                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                   85323
                                                                                                                                                                        85023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              85622
             1649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    819
                                                                                                                                                                                                                                                                                 agactaaagaa-----tagttatgtgatgtcgataaatgaaattcacacgcgtggtaat
tactttggatgittaaacttaatcttgtttcttcctacggtataaatattaatcatcgag 1708
                                  gcgaacttgtaacattacaatatttatattagatactagtatgtgattattccaaataca
                                                                                                 ttaaattgctttctttaatgcatctttaacatatttattgttagttggaatttaataaga
                                                                                                                                          catagatcttttgggttacagtttcgaagtcctctacaagcgtgtaaccatctgcaacta 1528
                                                                                                                                                                     aacaaaaacaagaaaaagaaaacgaattttcttggattccattccattgatctaaaatg
                                                                                                                                                                                                                  cctttagaaaattttggaattaccggttgttatgtaaatatagatttagtggtaaacaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                            agcataaaggacccgttcaagctatttatacaaagttacaaactgaatatagcttgaaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tttctttttgtttcgtttctctttaactatattattgcgggatatatgataacaatgata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TAATTTAAAATATAAATTAAGA------AAGATAATTTTATACTTTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TAATAATTAAATATTTAATAGTAATTAAATATTAAACAAATAATATAAATATTATATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gagtagtgacccatggagtatgtgaataattatcaaagagaataagagatgacaaccaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TIATTACATTATTATATATATTTTTTATAAAAAAATATAATTAAATAAATTAATT
                                                                              ATATATTTAATTTAATTATATATATATTTAATTTAATTGTATATATATTTAATTTATT
                                                                                                                           ATATTTCACATTTAATTAAAATAAAATAACCATTTATTAATTAACTTAATTAATATAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tatcacaaaacaattgtctgggaccattttgaataaactttttctcaaacattacgggac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ctgatctcaatattatgttccaggtatttgcataatcttctgttttaaagcatattttgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      attttctggatattcgttaaaatttgcgataacgattgtgaaaaatatttttatttgttag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             actggactcgacccttaaaatacgattttacagcgtcactagttgagattactagcataa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1118
                                                       1648
                                                                                                                                                                                            1468
                                                                                                                                                                                                                                                                                                                               1294
                                                                                                                                                                                                                                                                                                                                                                             1234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          85384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    85665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       938
                                  84784
                                                                                                                                                                     84964
                                                                                                                                                                                                                                                                                                                                                                                                  85264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 85504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            85785
```

```
VERSION
KEYWORDS
SOURCE
                                                                  REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                             REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT AE001398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                  ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                    DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Locus
                                                                                                                                      JOURNAL
MEDLINE
REMARK
                                                  JOURNAL
                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                 ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          84194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         84603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 84783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gttcttaaaatattttttttttatatttagttataaatacattatgaaccaataatagttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gctactatcaatagaagaaacagctgagtattacattttaattttaaagacaaaatttttg 1948
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | leatacattaagcaaattttaaaaaaattatata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATTTAAATTTATTATTTATTTATTTAATTAAATAAATTAACTT - - - - AATTATTTATTAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tttttatggaacaagaaataacagatagaaaactattttgttgtggaatggaagtagtaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ataacaatgcatagaaagttccaaaaaaaattttgttaacaggaaacttccaaattttttt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtgaattcaaatatctccattaatatttttttgaaatctacaaattattaatatttagtca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTATTTATTTATTATATTAATATTAATATTAATTTATTTATTATTTATTATTATTTAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aaaaatgttataatttctaacaatattattaaaaatatgatgcctataatgtatttcctat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATTATTTAATTAATTATATTATATATTAATATTTAATTTAATTTAATTTAATTTAATTTATTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTTAAATATTGTTAATTAATTAATTATTATTATTATTAATTAATTAATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gacagcctctacaactgtgatagtcaattttttctgcaaatattaaattaggaattcaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ttttgaaaatgtaacccttttactcatagattaattaccgtatgtttttgttgccataat 1828
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtaaaaaaagttttgtcttattttcgcgatgcatgaaggataaacctaatgactttaatt 1768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TATAAATTATTAATTTAATTTAATTTATTTATTTATTTACTAAATATATTAATTTAT
                                                                                                                                                                                                   Eukaryota; Alveolata; Apicomplexa; Haemosporida; Plasmodium.

1 (bases 1 to 14867)
Gardner, M. J. Tettelin, H., Carucci, D.J., Cummings, L.M., Aravi, Koonin, E.V., Shallom, S., Mason, T., Yu, K., Fujii, C., Pederson, Shen, K., Jing, J., Aston, C., Lai, Z., Schwartz, D.C., Pertea, M., Salzberg, S., Zhou, L., Sutton, G.G., Clayton, R., White, O., Smith, H.O., Fraser, C.M., Hoffman, S.L. et, al.

Chromosome 2 sequence of the human malaria parasite Plasmodium
Submitted (02-NOV-1998) The Institute for Genomic Medical Center Drive, Rockville, MD 20814, USA Location/Qualifiers
1...14867
                                                                                  2 (bases 1 to 14867)
Gardner, M.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  AE001398 14867 bp
Plasmodium falciparum
                                                                                                                      Erratum:[[published erratum 4;282(5395):1827]]
                                                                                                                                                      Science 282 (5391), 1126-1132 (1998) 99021743
                                                                                                                                                                                                                                                                                                                                                                                                                  AE001398 AE001362
                                                                    Direct Submission
                                                                                                                                                                                                                                                                                                                                                 Plasmodium falciparum
                                                                                                                                                                                                                                                                                                                                                               malaria parasite P. falciparum
                                                                                                                                                                                          falciparum
                                                                                                                                                                                                                                                                                                                                                                                                   GI:3845197
                                                                                                                                                                                                                                                                                                                                                                                                                                                    chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA
                                                                                                                                      appears
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          84163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2280
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                    INV
section
                                                                                                                                      'n
                                                                                                                                      Science
                                                                                                                                                                                                       parasite Plasmodium
                                                                                                                                                                                                                                                                                                                                                                                                                                                    35
                                                                                                                                                                                                                                                                                                                                                                                                                                                    \mathsf{of}
                                                  Research,
                                                                                                                                                                                                                                                                                                                                                                                                                                                    06-NOV-1998
73 of the
                                                                                                                                                                                                                                                                           Pederson, J.,
                                                                                                                                                                                                                                                                                             Aravind, L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         84195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              84370
                                                  9712
```

```
Qy
                                                                                                                                                        밁
                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                             Q
             Š
                                          맑
                                                                  QΥ
                                                                                                  밁
                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 1038
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                106
               346
                                                                                                                                                                                                                                                                            Local Sin
hes 1038;
                                                                                                                   gtattgttataacaaaatatctatcttttggtatatgagaaaatatggagtttggaattta
                                                                                                                                                                                                                                             AATTATGTATAAAATAATTTATATTAATTTAATTTTATTTATATATTTAATTTAA 7271
                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NNATTKKN"
11241. .1
                                                                                                                                                                                                                                                                                                                                                                                                                                                 LFNDIMKFSLYLCNIFLGKRIKTENENAVLĪIHNNDQTNYSNKENIKDIIIQKRIKEY
IFYKMENYKDFHFKLKDSDLLSIKLLSNTFVK NEVYKSYDFYLFNNISCILYNFLV
NRNSVKKYKDTYIYLLNDLSFVYKY IKNDRTKKKKRFFLLSSSMKELICKNILSVE
NRNSVKKYKDPYIYILDLDSFVYKY IKNDRTKKKKRFFLLSSSMKELICKNILSVE
RYIKHLHEEDNFDQKDQYVCSLTFLNNLFFDKIIHFHYIYNLMCHVYKTYNYFKCNKL
INEDIIISLLLTCSKFQYFIENNNDRYCRKELIHLKYNIIDDLIKNYLNTYKSISID
NISKLFISLSMSKYTCEVNENLLESLQSEFERVTKTSKKGGTHMADDNILDDNINSCE
KYEHRYIEYKKENLFINLNKIIECLIKLNIFLYLKKKKTYLYLYKQSLCPINLKENII
                                                                                                                                                                                                                                                                                                                                                                DMNLKYLCLENYKIKNEECAFLYTIDIVLFKER"
1019 c 1106 q 6458 t
                                                                                                                                                                                                                                                                                                                                                                                                        KKILYIANNLYMYEMYGYVCEMLERVLSSHKEQNLFSYNYNKNVEHKMFDKILCHISE
DDYIEMSNTMYVLFYDYLKNINSERQSNILRNNSTNDRFIDEIKEKKYKLNNNTLIKH
NNVKLNYEKSNNSNGNISNILKDDKNKNHNNVEMDLIDNKNENKKIQEKGQNGENCEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NFYCTLIKKGKYDNDMTIYKLKEVIKATHHILCDKTKNLETFCSDIDYSTLLNSLNNK
FILNKIIDKNFILFYECLLKILLNIKFVNFQSLCISLISLKNIYYNILRNNYYIVNNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FIVISLCDIIQSVKIEDELDKTFTDYNEYIEVKNIDKNVLNKINEIYEKNKDITFHRR
EILGKIOKINSYIHEMNGNEIHFLIYFFRWNKNDKNIILFYNYFNYVEDHAYLEN
HEIVKLLEIFNKYLNNNSIPFNKNLIQEMEFKLYYFREIKNEKNYIIKMKKEIYK
CFAKFHENVDHIDNEKILNILRLYVDNSILDIDINKMLCNLNNNLINENIEYISKLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="mfalkkntvregfvnicfsylkklylksnfvtvnlnyetnnekr
tnkklykkskaQslfdkglnihdklilfknlpkykcakyecisakevykylldeykkc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="PFB0495w"
11241. .14606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SSIFSKKRDSHKKGSSFRGRRSGFINRKSGSFKKPYYNNRLINKNYNNYKGRNFHNGR
DNFKGRTGSFGSRVFDNRKGSFKKRFISNRNKSSVKSYRGNGSNKMGRKSFNKAPTSR
TVYTKRLNNYKTVSAPVKKFNNLNISLYRKNRTFALNTKRSKPVGTIKSSVPRKRIKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(1570./gene="PFB0490c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="PFB0490c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Plasmodium
/db_xref="taxon:5833"
/chromosome="2"
                                                                                                                                                                                                                                                                                                                                                                                          CKDVLVNDIINIFGFLKMEKKKFLFFQLYMYLCNITKFKRRYVSSSSLFHMDVFKIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="PFB0495w"
/note="predicted by
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GLKKGSLKSKTRKSTSGSKFKPLNKYFLSKIKIVTSLNKIPSPLKEQKNTEVNLPESI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="hypothetical protein"
/protein_id="AAC71887.1"
/db_xref="GI:3845198"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="hypothetical
/protein_id="AAC71888...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       note="predicted"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /db_xref="GI:3845199"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                translation="MKEKNEKIMDYLSCPLDDVVDREKKSGKNSLLKSSSTKKSDYKK/
1.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .14606
                                                                                                                                                                                                                                                                          Score 129.4; DB 4;
Pred. No. 9e-09;
0; Mismatches 1306;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .2424)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       by GlimmerM"
                                                                                                                                                                                                                                                                                                                                                               φ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aı protein"
8.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GlimmerM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           falciparum"
                                                                                                                                                                                                                                                                                                       Length 14867;
                                                                                                                                                                                                                                                                            25;
                                                                                                                                                                                                                                                                            Gaps
                                                                                                  7331
                        Ş
                                                      DЬ
                                                                                 δÃ
                                                                                                                                      QY
                                                                                                                                                                         밁
                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
밁
                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7392
8466
                           1417
                                                                                                                                            1297
                                                                                                                                                                         8288
                                                                                                                                                                                                    1237
                                                                                                                                                                                                                                 8228
                                                                                                                                                                                                                                                            1177
                                                                                                                                                                                                                                                                                         8168
                                                                                                                                                                                                                                                                                                                     1117
                                                                                                                                                                                                                                                                                                                                                 8111
                                                                                                                                                                                                                                                                                                                                                                              1057
                                                                                                                                                                                                                                                                                                                                                                                                           8051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7931
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7871
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7512
                                                                                                                                                                                                                                                                                                                                                                                                                                      997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        878
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   581
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 701
```

```
ctttctttttgtttcgtttctcttaactatatattatcgcggatatatgataacaatgat 937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gatctcaatat---tatgttccaggtatttgcataatcttctgttttaaagcatattttgt 877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aatccagcaaattattaacaagagtattgagaaaaaaccgaaaaataagaaaagggaaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAATAAAAAAGAAATATATATGTTTATTAATTTAATAAATAAATTATATATATATTACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caagaaaaaagaaaacgatttttctttggattccattcaatgatctaaaatgcatagatc 1476
                                                                                                                                                                                                                                                                                                                   aatatgttaatcaattagtggtcaacatatacataattccttacagaaaaaaacaaaactta 1236
                                                                                                                                                                                                                                                                                                                                                                                               atcctttagaaaattttggaattaccggttgttatgtaaatatagatttagtggtaaaca 1176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TATATTTAAATATAAAAATGTGTATATAAATAAATAATTCTTTTTAATTTTATTTTTAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtagtgacccatggagtatgtgaataattatcaaagagaataagagatgacaaccaaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aaatacgagtgtgaatatccgtttatcgatcactccaatcatgattatgattcttgtgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgaagattttct-----taccaattaaaatttcgaattcatatctcttgattattaaatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ttttggttctggattaggtttatttgatcataattacatgcatcatttctttgattacta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acactggactcgacccttaaaatacgattttacagcgtcactagttgagattactagcat 1056
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    atat-cacaaaacaattgtctgggaccattttgaataaactttttctcaaaacattacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATAAATATATTAATATTATTTTAATTAATCTATTTGTTATGTATAATAATAAAACTAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       actaaagaatagttatgtgatgtcgataaatgaaattcacacgcgtggtaataattatgg
                                                                                                                                                                                                                       agagaagttaacatatccatatatgggtatgctatacctttcacgtatgctatactagag 1296
                                                                                                                                                                                                                                                                                             7631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7930
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7511
8525
                                                                      8465
                                                                                                                                                                                                                                                                                                 8287
                                                                                                                                                                                                                                                                                                                                                                                                                                               8167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7990
```

δÃ

밁

Š

ď Ş

밁

δã

Ş 밁

밁

```
LOCUS
                             AC025417
                                                  RESULT
                                                                                                                                                                                                         9422
                                                                                                                       9482
                                                                                                                                                                                                                                                                                                 9364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8944
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1477
                                                                                                                                                                                                                                                                                                                                            2311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1537
                                                                                                                                                ggcaaaaaaaagacaatgccaaaagtcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ctacaactgtgatagtcaattttttctgcaaatattaaattaggaattcaatgctactat 1896
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agtittgtcttattttcgcgatgcatgaaggataaacctaatgactttaatttttttgaaa 1776
                                                                                                                  ACTAAAAATTAAAATATATATAATGTATA
                                                                                                                                                                                                       taaaatattaactttaaaataaataaaaatttgagtaaatgtgttttctgactattgagg 2430
                                                                                                                                                                                                                                                                                              TTAATTTAAAAATATTTTTAAATTTATTT - - TTATTTAATCTTATATTTTATATTTAC
                                                                                                                                                                                                                                                                                                                                   gtaggtgtaattaataatgcatggtgcgattcagaattgggacaacaatgaaaacggaat
                                                                                                                                                                                                                                                                                                                                                                                   tacattaagcaaattttaaaaattatatataagcctatacgcgctcaaagtatgttatcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tttatggaacaagaaataacagatagaaaactatttgttgtggaatggaagtagtaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gaattcaaatatctccattaatattttttgaaatctacaaattattaatatttagtcaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aatattttttttatatttagttataaatacattatgaaccaataatagttgg-----t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tataatttctaacaatattattaaaatatgatgcctataatgtatttcctatgttcttaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   caatagaagaaacagctgagtattacattttaatttaaagacaaaatttttgaaaaatgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     atgtaacccttttactcatagattaattaccgtatgtttttgttgccataatgacagcct 1836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             argittaaacttaatcitgtitcitcctacggtataaatattaatcatcgaggtaaaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ctttctttaatgcatctttaaccatatttattgttagttggaatttaataagagcgaactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ttttgggttacagtttcgaagtcctctacaagcgtgtaaccatctgcaactattaaattg 1536
      AC025417
      106142
      đ
      DNA
                                                                                                                                                            2459
      PLN
      09-JAN-2001
                                                                                                                                                                                                         9481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8943
                                                                                                                                                                                                                                                                                                 9421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                          COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOURCE
                                                                                                                                                                                                                                                                                                                   FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                          source
                                                                                                                                                                                                                                                                                                                                                                                                          Khan, S., Kim, C., Altafi, H., Bei, B., Chao, Q., Johnson-Hopson, C., Khan, S., Kim, C., Altafi, H., Bei, B., Chin, C., Chiou, J., Choi, E., Conn, L., Conway, A., Gonzalez, A., Hansen, N., Howing, B., Koo, T., Lam, B., Lee, J., Lenz, C., Li, J., Liu, A., Liu, J., Liu, S., Mukharsky, N., Ngyen, M., Palm, C., Pham, P., Sakano, H., Schwartz, J., Southwick, A., Thaveri, A., Toriumi, M., Vaysberg, M., Yu, G., Davis, R., Federspiel, N., Theologis, A. and Ecker, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Cheuk, R., Shinn, P., Brooks, S., Buehler, E., Chao, Q., Johnson-Hopson, C., Khan, S., Kim, C., Altafi, H., Bei, B., Chin, C., Chiou, J., Choi, E., Conn, L., Conway, A., Gonzalez, A., Hansen, N., Howing, B., Koo, T., Lam, B., Lee, J., Lenz, C., Li, J., Liu, A., Liu, J., Liu, S., Mukharsky, N., Nguyen, M., Palm, C., Pham, P., Sakano, H., Schwartz, J., Southwick, A., Thaveri, A., Toriumi, M., Vaysberg, M., Yu, G., Davis, R., Federspiel, N., Theologis, A. and Ecker, J.
                                                                                                                                                                                                                                                                                                                              Submitted (09-JAN-2001) Arabidopsis thaliana Genome Department of Biology, University of Pennsylvania, 3 Hamilton Walk, Philadelphia, PA 19104-6018, USA On Jul 25, 2000 this sequence version replaced g1:79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Direct Submission
Submitted (27-JUL-2000) Arabidopsis thaliana Genome
Department of Biology, University of Pennsylvania, 3
Hamilton Walk, Philadelphia, PA 19104-6018, USA
5 (bases 1 to 106142)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Chao, Q., Brooks, S., Buehler, E., Johnson-Hopson, C., Khan, S., Kim, C., Shinn, P., Altafi, H., Bei, Q., Chin, C., Chiou, J., Choi, E., Conn, L., Conway, A., Gonzales, A., Hansen, N., Howng, B., Koo, T., Lam, B., Lee, J., Lenz, C., Li, J., Liu, A., Liu, S., Mukharsky, N., Nguyen, M., Palm, C., Pham, P., Sakano, H., Schwartz, J., Southwick, A., Thaveri, A., Toriumi, M., Vaysberg, M., Yu, G., Federspiel, N.A., Theologis, A. and Ecker, J.R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (25-JUL-2000) Arabidopsis thaliana Genome Center Department of Biology, University of Pennsylvania, 38th St. Hamilton Walk, Philadelphia, Pennsylvania 19104-6018, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (09-MAR-2000) Arabidopsis thaliana Genome Center, Department of Biology, University of Pennsylvania, 38th Street Hamilton Walk, Philadelphia, Pennsylvania 19104-6018, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Brassicales; Brassicaee; Arabidopsis.

1 (bases 1 to 106142)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Genomic sequence for Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ecker, J.R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Genomic sequence for Arabidopsis thaliana BAC T12C24 from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       thale cress
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AC025417.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 106142)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (bases 1 to 106142)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (bases 1 to 106142)
                                                                                                                                  /note="similar to emb|CAA18252.1"
                                                                                                                                                                                                                   /organism="Arabidopsis
/db_xref="taxon:3702"
/chromosome="1"
                    /protein_id="AAF88073.1"
/db_xref="GI:9502366"
                                                                                                                                                                              /clone="T12C24"
121. .786
                                                                                                                                                                                                                                                                                              1. .106142
                                                                /evidence=not_experimental
/product="T12C24.1"
translation="MQLILSEFVPNGSLYDNLHLRIFPGTSSSYGNTDLNWHRRFQIA/
                                                                                                                /codon_start=1
                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ļ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complete sequence
                                                                                                                                                       CLV1
                                                                                                                                                         receptor kinase like
                                                                                                                                                                                                                                                                       thaliana'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 thaliana BAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 T12C24 from
                                                                                                                                                                                                                                                                                                                                     g1:7940297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  38th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
```

Ş 밁

Q 밁 밁 Ş

δÃ

õ 밁 õ B Š

밁

밁 Ş В Ş 밁 Qy 밁 8 밁 Q 밁

```
ELPGELINA ON THE ACTION OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="merkqsnahstfadinevedeaeqelqqqennnnkrfsgnrgpn rgkqrpfrgsrqvsletgffsgvalhstfadinevedeaeqelqqqennnkrfsgnrgpn rgkqrpfrgfsrqvsletgfsylnrsgrerddkslersgrekddsineveaalt rgkddgr ktdesketsktlskoksllpsiltererdlenkthetertrddsinenkagratnel rgpeldevknbedillpkeeqompellreplgcegiclglssqavlenenkagratnel hitplinlywelfslyvlysysftyilkcifyfeavkreyhpvrvneffapwvcme laisvppmfsprkkylhpaimcypfmgptfelkiyggwlsgrekrlckyanpsshls vygmygailaskughpvysm filaktuyvvyfyllygrlptsbalkskelhpvysm filaktuylvsysftoffilktijislvarinetgfkesvamwsytg pmftasyatikyepdgcsrtcrffilketgfkrckyanwsytg pmftasyatikyepdgcsrtcrffilketgfkrckyanwsytghtapapsasiawitysgelpskelksplaktuylstagetgrekrymygthepndl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Join(1701. .1863,1982. .2194,2289. .2428,2519. .2614,
2962. .3103,3181. .3226,3339. .3483,3599. .3742,3849. .3968,
4112. .4168,4249. .4308,4456. .4563,4722. .4864,5060. .5138,
5247. .5309,5402. .5532,5618. .5723,5908. .6096,6220. .6495,
6595. .6750,6873. .7034,7168. .7284,7367. .7543)
/note="unknown protein; similar to ESTs gb|A1999041.1,
and db|AV547742.1"
                                                                                                                                                                                                                                    complement(join(13884. .14297,14628. .15299))
/note="similar to phosphate/phosphoenolpyruvate
translocator precursor gb|AAB40647.1; similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="MSKKQRCLRMESLPHEVVERILEKTCCGFSAEIHGCIETMEIID
RISILPTKTIDTASALRSREDYFNPDLKHLTTLVLGSSSSVTIPTPPMEKDKEKEKEKE
KEDDEEFFLYSFDSCDGLYCLYKYKSGYVVNPTRWYRPLPLSQLQQLLISLGRSVFE
LGYTVCDIGFGKDKITGTYKPVWLYNSLEIGLENATTCEVFDFNTNAWRYVSPTAPYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RYDFGVGSSNDIDLAVGRTGEQSIHKVFVDPGGSHCIATVTGVGGAETFYTHAKWLKP
RVLSRLKGLLVNAVAWNRQQITEVSTKEIILGTQDGQLFEMAVDEKDKREKYIKFLFE
LEELPEAFKALQMETANISSGMRYYVMAVTPTRLYSFTGIGTLESVFASYKERAVHFM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DLLETGSASDCFDRRLREFEENELIQVMKLGLLCTSENPLKRPSMAEVVQVLESIRNG
FGS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LGTAKALSFLHNDCKPAÏLHLNVKSTNILLDERYEAKLSDYGLEKFLPVMDSFGLTKK
FHNAVGYIAPELAQQSLRASEKCDVYSYGVVLLELVTGRKPVESPSENQVLILRDYVR
                                                                                                                                                                                                                                                                                                                                                                                                     TESYDVAFNDYSIGYPLCYFQSLISIS"
                                                                                                                                                                                                                                                                                                                                                                                                                                              EETK I LSFDLHT ET FRVVSKAPFTNVKAFD I VMCNLGNRLCVSEKNWPNQV I WSFNSG
NKTWHKMF S I NLDVT SHWFGNH I AAVMPLALF Y EKKKKKKLLF Y CRVRSRTLMVYDPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    join(11098. .11279,11308.
/note="hypothetical prote
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AIAITKRKLTREKKPFKRAYDLKRWTKQALAKKISAEKDFEAEEESHH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /evidence=not_experimental
/product="T12C24.3"
/protein_id="AAF88102.1"
/db_xref="GI:9502395"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="AAF88074.1"
/db_xref="GI:9502367"
                                                                                                                                                                                               dbj|AV524415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              translation="MDQGRQVFSVDLLERYATKNRGMITCMAAGNDVIVLGTSKGWII/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /evidence=not_experimental
                                              /evidence=not_experimental
/product="T12C24.5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /protein_id="AAF88075.1"
/db_xref="GI:9502368"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="T12C24.4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /evidence=not_experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="T12C24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
                                                                                                                                                                                          gb|A1995339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12211)
                                                                                                                                                                                                     dbj|AV542831.1"
                                                                                                                                                                                                                                              to ESTs
멍
                                                                                        Qy
                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                  3469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    402;
```

CDS

CDS

CDS

```
AATGTGTGTTTTAAAAGTGATGTTGATATGTGCAGGTATGGCCCAATTTTCAAGACCAAT 93107
                                   tttttgaaatttgactaatgttgtttattttacaggtatggtaagatatatagatcgaac 3528
                                                                                                                                                                                                                                                                                                                                                                                                              GGAGAAATCCTAAATGCAGAGGGAAACTTCCACCTGGTTCCATGGGTTTCCCTTTACTCG 92927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gaagaaatagaaaaaccagattcaatctacctccgggtaaatccggttggccatttcttg 3350
                                                                                                                                                                                                                                                                         GCGAGAGTATCCAATTCTTCAAGCCAAACAAAACTTCAGACATCCCTCCTTTTATCAAAG 92987
                                                                                                                                                                                                                                                                                                                                  gtgaaaccatcggttatcttaaaccgtacaccgccacaacactcggtgacttcatgcaac 3410
                                                                                                                                    AGAGAGTTAAGAAGTAAGTATCTCACTTCTCTCATTCAAAACAATGTGATTAATGCTTAT 93047
                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(join(17619. 17885,17959. 18182,18485. 18717. 18789,18871. 18897,19006. 19242))
/note="similar to Cu/Zn-superoxide dismutase copper chaperone precursor gb|AAb52685.1; similar to ESTs db|AV442631.1, gb|BE038022.1, db|AV441271.1, db|AV530707.1, db|AV561064.1, and db|AV561353.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LSLAQLAVTGLQEDLRNNMISVVKESTSLKRHGAQNMKTROLSDAIFEEVGSKMLSQL
SDGLWGIIRSEDGMKNEIRETVQSVYATLSNPRGEKRGTSAREMEHKIPTPKKEARTD
FNTSPASKQKQELIKGAVEDNKGEACSDDVQDNKGEAYNDDEEDPELPPGFG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
/evidence=not_experimental
/product="T12C24.7"
/protein_id="ARB8099.1"
/db_xref="G1:9502392"
/translation="MARKISKEEVVEKLKDDGDFDRLRLKIIRRLKENVSPLSLSPSS
/translation="MARKISKEEVVEKLKDDGDFDRLRLKIIRRLKENVSPLSLSPSS
/translation="MARKISKEEVVEKLKDDGDFDRLRLKIIRRLKENVSPLSLSPSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AVKNKLETIEGIEKVEVDLSNQVVRILGSSPVKAMTQALEQTGRKARLIGQGVPQDFL VSAAVAEFKGPDIFGVVRFAQVSMELARIEANFTGLSFCTHSWCINEYGDLTNGAAST GSLYNFFGDQTGTEPLGDLGTLEADKNGEAFYSGKKEKKVADLIGRAVVVYKTDDNK SGPGLTAAVIARSAGVEENYKKLCSCDGTVIFFEATNSDFVASKV SGPGLTAAVIARSAGVEENYKKLCSCDGTVIFFEATNSDFVASKV complement(join(19464. 19818,19915. 20047,20203. 20316,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(join(19464. .19818 20580. .20642, 20957. .21104))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="mveaqswttrrms.nprfdaaataaptivdipgtpphssassplk
pfelssptvsptiltaaiiaaapgs.nigvlllnkyllfygfrkpiftymthmlsgaa
yssaviniagivprqhiltsrqoflkilslsaifclsvvgntslrxipvsfnQaigat
tpfstavfsflltcktsstevvlallfyvsgjvlasnspsfhlegfllcvastagra
lksvvQgiiltseseklhsmnlllymapmaacillpftlyiegnvlrvliekartdppl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="mnfpdsslftpnfayendldfsslitpstrvsfqepkpcnpvih
sagiendgrqncettmtlseimkgddepknkrakhkelerqrrqentslfkilryllp
sqyikgkrssadhvleavnyikblqkkikevsekrdrikrsithpssrgefsirslas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20580. .20642,20957. .21104)
/note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                join(24991. .25437,25649. .26173)
/note="similar to D-3-phophoglycerate dehydrogenase
sp|P35136|SERA_BACSU; similar to EST gb|T245682.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STCSCVGDTNIAVVVRPCLIGLEIVVSCCNRHESCLSSVLQLLAQEQCFNIVSCISTR
LHQGFIHTIASEVIIYNLSSI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /evidence=not_experimental
/product="T12C24.8"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          join(23302. .23622,23752.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MASILRSVATTSAVVAAASAIPIAIAFSSSSSSSSTNPKSQSLN
FSFLSRSSPRLLGLSRSFVSSPMATALTSDRNLHQEDRAMPQLLTEFMVDMTCEGCVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /evidence=not_experimental
/product="T12C24.6"
/protein_id="AAF88100.1"
/db_xref="GI:9502393"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IAGFGVTIMGVVLYSEARKRSKLLNQK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              I I F LLAGNAT VAY LVNLT NF LVT KHT SALT LQVLGNGKAAVAAGVSVL I F RNPVT VMG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /protein_id="AAF88076.1"
/db_xref="GI:9502369"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         note="hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="GI:9502394"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 128; DB 12;
Pred. No. 1.1e-08;
0; Mismatches 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .24150)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      395;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 106142;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .18182,18485. .18619,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ψ
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                           SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 10
PFMAL3P5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                         KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Snoo
                                      JOURNAL
                                                                             AUTHORS
                                                                                                                    MEDLINE
                                                                                                                                       JOURNAL
                                                                                                                                                                              TITLE
                                                                                                                                                                                                                                                                                                                                      AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     93108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          93643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   93526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               93228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           93168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4009
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3709
                                                                                                                                                                      Serine/threonine protein phosphatase.

malaria parasite P. falciparum.

SM Plasmodium falciparum falciparum

Eukaryota; Alveolata; Apicomplexa; Haemosporida; Plasmodium.

E 1 (bases 1 to 86827)

Bowman, S., Lawson, D., Basham, D., Brown, D., Chillingworth, T.,

Churcher, C. M., Craig, A., Davies, R. M., Devlin, K., Feltwell, T.,

Gentles, S., Gwilliam, R., Hamlin, N., Harris, D., Holroyd, S.,

Hornsby, T., Horrocks, P., Jagels, K., Jassal, B., Kyes, S., McLean, J.,

Moule, S., Mungall, K., Murphy, L., Oliver, K., Quail, M. A.,

Rajandream, M.-A., Rutter, S., Skelton, J., Squares, R., Squares, S.,

Sulston, J.E., Whitehead, S., Woodward, J.R., Newbold, C., and

Barrell, B.G.

The complete nucleotide sequence of chromosome 3 of Plasmodium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aggagttgtctctgctcctctaaatctaccaggaactgcttatcataaagctcttcaggt 4068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aactttttttttttaattgaacagtttaatcttaatctaatggcgaagcatataatgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CTGGTGGGGAGACCAGTTATTGTATCAACAGATGCTGATTTGAGTTATTTTGTGTTTAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ttgtttggagaaccaacgatcgtatcagctgatgctggacttaatagattcatattacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAATATCAACGTTCATGCTTCAAA 93666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            acatttattttttttgctgtaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCATGATCC - - - AGACAAGTCATCAGAGAATCTAAGGGCAAACTTTGTTGCTTTCATACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTCTAACATGTTAGTA - - TGATCAGATGATATTTGATCTCACCGCGAAGAAGTTGATCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAGAATGTGGGTTCATTACATGGTTTCATGTACAAGTACCTTAAAAAACATGGTTTTGACT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tggtcgatgcttgttcttgttggtgacatgcatagagatatgagaagtatctcgcttaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CAAGAGGGACGTTGTTTCCAGAGTTGGTATCCAGACACTTTTTACACACATCTTTTGGGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aacgaaggaaggctctttgaatgtagttatcctagaagtataggtgggattcttgggaaa 3648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGGATTGATCTCTTTCCCTTTTGATATCCCAGGCACAGCTTATCACAAAATGTCTACAGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGTTTCCCATTCAGAATATAGACTTTTATATATGTTTCAGTCTATAATGTTTTATTACTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtttttattttatctttattttgctaaattttttgtttatgaatctttagagtttct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGGTTGGAGCTTTGGTCAAATCAAGATTCAGTAGAACTCAAAGATGCAACCGCAAGCGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tttgttcttgattcttggcaacaaaactctattttctctgctcaagacgaggccaaaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CTCTTTGGCCATGATGGTCTCAAGAAGATGCTTCCTCAAGTAGAAATGACTGCCAATAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ttcttaagtcacgcacgtcttagaactattctacttaaagatgttgagagacatactttg
                                                                                                                  Nature 40
99376085
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Plasmodium falciparum MAL3P5, complete sequence.
AL034556 AL008971 AL008972 AL008978 AL010141 AL010153 AL010162
AL010206 AL010210 AL139179
AL034556.3 GI:7711064
HTG; centromere; CTRP protein; initiation factor E4;
                                                                         2 (bases 1 to 86827)
Bowman, S., Skelton, J.,
                                  Unpublished
                                                             Barrell
  Lawson,
                                                                                                                                                           falciparum
(bases 1 to 86827)
                                                                                                                                   400 (6744), 532-538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         86827 bp
  and
                                                                         Churcher, C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4092
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA
  Barrell,
                                                                                                                                     (1999)
                                                                             Lawson, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANI
                                                                             Quail, M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       04-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3828
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             93287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     93642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 93582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4.008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               93525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3948
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         93467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 93347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           93227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     93167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3588
```

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Direct Submission
Submitted (17-DEC-1998) P.falciparum Genome Sequencing Consortium,
The Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridg
CB10 15A, UK
On May 5, 2000 this sequence version replaced gi:4493931.
For more information about this sequence or the Malaria Project,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                http://www.sanger.ac.uk/Projects/P_falciparum.
/translation="Mightkknyfyllvsypsleayflkrhkdnennyetlinnndie /translation="Mightkknyfyllvsypsleayflkrhkdnennyetlinnndie /translation="Mightkknyfyllvsypsleayflkrhkdnennyetlinnnykk kikkirhiknkosyipllfilniybyyrk krreanikvreisbequefnkryryietylleyslkygilsphlslyilknisekvatyp slyvynkldnkhulinekklkyfkqinnehtqoaptnhthhunnnnkkpldinihsc krreanikvrypkynnykkbenochitlnaiyllkylcyknyfissisysgynnmekeninydkynthheyteksisykbenochitlnaiyllkoytyknmeilllavinykkrisokekkkinokknynchunitslekkutyp duicriclutuntylllikylcyknmeilllunynhebenochitlnaiyllkkroytybetrinniykyisony fydhinssyrrekkriydlexhilinkkekkekpymkksdhekknuhungcunuhicsnkbefokknihtlekkme fokokkiiyllkkryfkklungoldinellymiyminhecodnkrhoytkrnihtlekkme fokokkiiyllksadymnhilrailkkroythymiymllecodnkroythekkmitslakkonitkkroythekkmitslakknihtsbefokknihtlekkmi yelakiydketrynnydketrktytynnnnicsnkmlosnkholicsnkhotytrakkekkek yelakiynikkadytythilkkotseth nunnicsnkholicsnkholicsnkholikkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkkotshilkko
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="mylknvyiyisscrilfdlcfsfhllkmkyknhmnnmksytffl rspriyarfkrokshlinglut infolgesfhllkmkyknhmnnmksytffl rspriyarfkaksrikkolentilefskhlinglstikkfomshit nultrikgythkkksneftkenikolllhypskidpkisinholstikkfomshit vhsilnglssrikkolenylalhleflkdenitlefsmhindfekskokviecird irskkrakknlsiyinlefcyrlilyftycmclliky ishlcifffeffcyriler iyescygdlirkieryknleglirkmishlalkkheinhmkdbdlyfnytydellr iyescygdlirkierynlydellr fymklnegnikknikkiennkdbblyfnytydellr fymklnegnglirkniknilisbopenbenkkelkgytyeofolendniikylebdplynnnsindnunningmknikhkik dtynddbdyfyeofolendniikylebdplynnksilefkomfiegobenksikefkomfiegobenksikefkomfiegobenksikefkomfiegobenksikefkomfiegobenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbenksikerikopenbe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="PFC0580c, MAL3P5.2"
/note="PFC0580c (MAL3P5.2), Hypothetical protein,
1097 aa, possible signal sequence, predicted usin
hexexon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(3354..6644)
/gene="pFC0580c, MAL3P5.2"
complement(3354..6644)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="Hypothetical protein,
/protein_id="CAB38968.1"
/db_xref="GI:4493932"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="predicted splice donor PFC0575w (revised)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="predicted splice
(revised of PFC0575w)"
1024..1029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="predicted splice
PFC0575w (revised)"
816. .825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Join(322. ..., MAL3P5.1"
/gene="PFC0575w, MAL3P5.1), Hypothetical protein,
/note="PFC0575w (MAL3P5.1), Hypothetical protein,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YPIIKNEKTVLDLLNYGYKIVMSPDVDNSLFEKTKIDSIPNEKDKNNQMENQKNSKNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="Hypothetical protein,
/protein_id="CAB38969.2"
/db_xref="GI:7711065"
/db_xref="SPTREMBL:097258"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IIMFNVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              join(322. .603,826. .1023,1197. .1301,1458.
/gene="pFC0575w, MAL3P5.1"
join(322. .603,826. .1023,1197. .1301,1458.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /strain-"3D7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="SPTREMBL:097257"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /clone="MAL3P5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /chromosome="3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="taxon:5833"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Plasmodium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .86827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        falciparum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     acceptor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   donor sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for exon 1 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for exon 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .2942)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 new exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cambridge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    len:
```

gene

CDS

```
misc_feature
                                                                                                                                                                                                                                                misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                   misc_feature
  misc_feature
                                misc_feature
                                                             misc_feature
                                                                                           misc_feature
                                                                                                                         misc_feature
                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                               misc_feature
                                                                                                                                                                                                                                                                                                             misc_feature
                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                       misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                /note="potential s
PFC0581w"
7901. 701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="potential s
PFC0581w"
                                                                                                                                                                                                                                                                            /note="potential s
PFC0581w"
8293. .8301
 9112. .9121
/note="potential :
prC0581w"
9259. .9264
                                                                                                                                                                                                                                                                                                                                                  /note="potential s
PFC0581w"
7941. .7947
/note="potential s
PFC0581w"
                                                            PFC0581w"
9007. .90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YFLKMNEHINRKLYKMKRAFHYYIYNFDQFIINNYYHIIHKKNIHKIHIHLKQCKDKE
IDIVKFKDLYYCMINNINNIESYIHKVDHNECYYRIFKAYNKILYEYWYLNEKENIY
YKKKIKKYLTYLNNISADLYPYNISYNKIYNONKYKNRKHESHIFYSIKNDIHLLE
LYTQRIQNCCDIFSYIYKKYNENEKNPFLNYLYYELHYIVYSEKKKKKFSFISSSP
YSYDIMVNSETFSYFFFSLSYLLFILFYHPDMYASYIFFKTLTYSGLPTYYYSLYNNI
                                                                                           8913.
                                                                                                                                8704. .8712
/note="potential
PFC0581w"
                                                                                                                                                                                    8642.
                                                                                                                                                                                                                   8559.
                                                                                                                                                                                                                           8369. .8374
/note="potential
PFC0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="potential splice acceptor sequence for
PFC0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OKIPHIYFANEQIASSFFESHKNYRYTKEDIIDGIEKCWFNITDYLISESIKQDNDFS
NDIKTTYTAMKNKMDCLLTISYSNKKIDTVNASFQWAQSPEYIFLNIKESHRWSSPGA
LKVKDEEIVSKKNNFSFSALSNDSNSYTKKIIVDLTLLDNIESETKURASVGKVYV
TLKKEKKIUNRLLLSKEKYPNMQVWWDMKEKRIHIITFVTINLFELLSLSHRYHDSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="PFC0581w, hypothetical protein, len: 324 as revised: new gene prediction, splicing prediction tentative"
                                                                                                                         8813.
                                                                                                                                                                /note="potential PFC0581w"
                                                                                                                                                                                               PFC0581w"
                                                                                                                                                                                                                                                                                                                                           8055.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QNFLKEEKNNSDKLQDDIDEDEEKYFDEEILREAKKKSEEYDKDDEEL" 7790. .7799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
/product="hypothetical protein, PFC0581w"
/protein_id="CAB90285.1"
/db_xref="GI:7711066"
/translation="MKKKKHYFSIKFVNVDKNKYVLCSKDYIRIINYMIGLHIFRLL
                                        /note="potential
PFC0581w"
                                                                                                    PFC0581w1
                                                                                                                                                                                                      8559. .8567
/note="potential
                                                                                /note="potential
                                                                                                             note="potential"
                                                                                                                                                                                                                                                                                                                               /note="potential
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="PFC0581w"
                                                                                                                                                                                   .8647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7669. .7717,7800. .7829,7912. .
.8368,8568. .8641,8713. .8812.
.9505,9613. .9838)
                                                                                           .8923
                                                                                                                         .8818
                                                                                                                                                                                                                                                                                                                                          .8063
                                                              .9012
                                                                                                                                                                                                        splice
                                                                                                                                                                                                                                      splice
                                                                                                                                                                                                                                                                     splice
                                                                                                                                                                                                                                                                                                  splice
                                                                                                                                                                                                                                                                                                                                splice
                                                                                                                                                                                                                                                                                                                                                              splice
                                                                                                                                                                                                                                                                                                                                                                                                                         splice
                    splice acceptor sequence
                                                  splice
                                                                                splice
                                                                                                              splice
                                                                                                                                           splice
                                                                                                                                                                         splice
                                                                                                                                                                                                                                                                                                                                                                                            splice
                                                                                                                                                                                                                                                                     acceptor
                                                                                                                                                                                                                                                                                                                                acceptor
                                                                                                                                                                                                                                                                                                                                                                                            acceptor
                                                  donor
                                                                                acceptor
                                                                                                              donor
                                                                                                                                           acceptor
                                                                                                                                                                                                       acceptor
                                                                                                                                                                                                                                     donor
                                                                                                                                                                                                                                                                                                   donor
                                                                                                                                                                                                                                                                                                                                                              donor
                                                                                                                                                                                                                                                                                                                                                                                                                         donor
                                                  sequence
                                                                                                              sequence
                                                                                                                                                                         sequence
                                                                                                                                                                                                                                      sequence
                                                                                                                                                                                                                                                                                                  sequence
                                                                                                                                                                                                                                                                                                                                                              sequence
                                                                                                                                                                                                                                                                                                                                                                                                                         sequence
                                                                                sequence
                                                                                                                                                                                                                                                                   sequence
                                                                                                                                           sequence
                                                                                                                                                                                                       sequence
                                                                                                                                                                                                                                                                                                                                sequence
                                                                                                                                                                                                                                                                                                                                                                                           sequence
                                                  for
                                                                                                              tor
                                                                                                                                                                          for
                                                                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                          for
                     for
                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                                 tor
                                                                                tor
                                                                                                                                           for
                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                                                                                                            for
                                                  exon
                                                                                                                                                                                                                                      exon
                                                                                                                                                                                                                                                                                                                                                                                                                          exon
                                                                                                                                                                                                                                                                                                   exon
                                                                                                                                                                                                                                                                                                                                                              exon
                                                                                                                                                                                                                                                                                                                                                                                            exon
                     exon
                                                                                                                                                                                                        exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                        exon
                                                                                                                                            exon
                                                                                                                                                                                                                                                                     exon
                                                                                                                                                                                                                                                                                                                                 exon
                                                                                 exon
                                                                                                                                                                                                                                                                                                   4 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aa,
                                                  æ
                                                                                                                                                                           σ
                                                                                                                                                                                                                                      G
                                                                                                                                                                                                                                                                                                                                                                                                                           N
                                                                                                                                                                           of.
                                                                                                                                                                                                                                      of
                                                                                                                                                                                                                                                                                                                                                              of
                                                                                                                                                                                                                                                                                                                                                                                                                           of.
                     و
                                                                                œ
                                                                                                                                             7
                                                                                                                                                                                                        6
                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                4
                                                                                                                                                                                                                                                                                                                                                                                            ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                        N
                                                                                                                                                                                                                                                                                                                                Of
                                                                                                                                                                                                                                                                                                                                                                                                                                                        of.
                     of
                                                                                of
                                                                                                                                            of.
                                                                                                                                                                                                        of
                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                                                                                                                           of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .9258
                  Ş
                                                          Š
                                                                                밁
                                                                                                  QΥ
                                                                                                                       Дb
                                                                                                                                         200
                                                                                                                                                                                  Q
                                                                                                                                                                                                       В
                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                         ρy
В
                                       В
                                                                                                                                                                В
                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                 QY
                                                                                                                                                                                                                                                                                        39019
                                                                                                                                                                                                                                                                                                                                                                                                               38839
                                        39376
                                                                                39316
                                                                                                                        39259
                                                                                                                                                                39199
                                                                                                                                                                                                        39139
                                                                                                                                                                                                                                                39079
                                                                                                                                                                                                                                                                                                                                38959
                                                                                                                                                                                                                                                                                                                                                                        38899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                    155
                    634
                                                            574
                                                                                                    515
                                                                                                                                                                                    395
                                                                                                                                                                                                                           335
                                                                                                                                                                                                                                                                   275
                                                                                                                                                                                                                                                                                                            215
                                                                                                                                                                                                                                                                                                                                                                                           95
                                                                                                                                                                                                                                                                                                                                                                                                                                   35
```

```
Query Match
Best Local Simi
Matches 1051;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tacaatataaatttcgtgtttctggttattctgttcacatgatttgagtttggttctcaa 94
                                                                                                                   TAATATACAAATATAAATCATGCTTTTAAAAATAAATATATAATTTTTATTAATATATAAA 38898
atctttacattgtattgttataacaaaatatctatctttggtatatgagaaaatatggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggaaagagtagtgacccatggagtatgtgaataattatcaaagagaataagagatgacaa
                                                                          ttgtgctaatccagcaaattattaacaagagtattgagaaaaaaaccgaaaataagaaaag
                                                                                                                                   taaattaaatacgagtgtgaatat-ccgtttatcgatcactccaatcatgattatgattc
                                                                                                                                                                             tttgattactatgaagattttcttaccaattaaaatttcgaattcatatctcttgattat 514
                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                y506. .9511
/note="potential sprc0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(join(10024...10044,10320...10336,10397...10445,
10613...10674,10773...10798,10929...10999,11157...11237,
11453...11515,11715...11767,11950...12040))
/gene="PFC0582c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(join(10024. .10044,10320. .10336,10397.
10613. .10674,10773. .10798,10929. .10999,11157. .
11453. .11515,11715. .11767,11950. .12040))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="potential splice accetor sequence for exon 11 PFC0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9601. .9612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="potential
PFC0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9361. .9368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="potential
PFC0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="hypothetical protein,
/protein_id="CAB90286.1"
/db_xref="GI:7711067"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="PFC0582c, hypothetical protein, len:
revised: new gene prediction"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="PFC0582c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 127.8; DB 96;
Pred. No. 1.2e-08;
0; Mismatches 1307;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   splice
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              splice
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         splice
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   donor sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acceptor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         donor sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PFC0582c*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     86827;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aa,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7. .10445, .11237,
                             693
                                                                                                                                               573
                                                                                                                                                                                                                                                                                                                            394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        214
                                                                                                                                                                           39315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11;
```

```
δ
                                                                                       В
                                                                                                                                                                                                   8
                                           В
                                                                                                           δÃ
                                                                                                                                    밁
                                                                                                                                                       δÃ
                                                                                                                                                                               В
                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ő,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
В
                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                      40148
                                                                                                                                      40328
                                                                                                                                                                                                                           40208
                                                                                                                                                                                                                                                                                                                                                             40029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           39792
                                                                                                                                                                                                                                                                                                                                                                                                                                                     39912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              39612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    39496
                                                                                                                                                                                                                                                                                           1354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1054
                                                         cttgtaacattacaatatttatattagatactagtatgtgattat--tccaaatacatac 1651
                                                                                                                                                                                               atctttgggttacagtttcgaagtcctctacaagcgtgtaaccatctgcaactattaaa
                                                                                                                                                                                                                                                                                                                                                                          ttaagagaagttaacatatccatatatgggtatgctatacctttcacgtatgctatacta
                                                                                                                                                                                                                                                                                                                                                                                                                      acaaatatgttaatcaattagtggtcaacatatacataattccttacagaaaaaaccaaac 1233
                                                                                                                                                                                                                                                                                                                                                                                                                                                               gaaatcctttagaaattttggaattaccggttgttatgtaaatatagatttagtggtaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cataaagcataaaggacccgttcaagctatttatacaaagttacaaactgaatatagctt 1113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATATTTATTTAATTAATTATTTATATTTAAAGTATTTTAATTTAATTAATATTTATTTA
                   aaaaaagttttgtcttattttcgcgatgcatgaaggataaacctaatgactttaattttt 1771
                                            ttgctttctttaatgcatctttaacatatttattgttagttggaatttaataagagcgaa
                                                                                                                                                                                aaacaagaaaaaaaaacgatttttcttggattccattcaatgatctaaaatgcatag
                                                                                                                                                                                                                                                                     gagactaaagaatagttatgtgatgtcgataaatgaaattcacacgcgtggtaataatta
                                                                                                                                                                                                                                                                                                                                                            gggacactggactcgacccttaaaatacgattttacagcgtcactagttgagattactag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgatatatcacaaaacaattgtctgggaccattttgaataaactttttctcaaacattac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ttgtctttcttttgtttcgtttctctttaactatattatcgcggatatatgataacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AATAATTCAAATAAATATATATAATATATATTAATTAAATTAATTAATTTAAATAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tttggattttctggatattcgttaaaatttgcgataacgattgtgaaaaatattttattt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTAATAATTAAAATAAATTAAATTAATATATTATTAATTAATAAATAATAAATAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1293
                                                                                                                                                                                                     1533
                                                                                                                                                                                                                                                                                          1413
40566
                                                                                       40446
                                                                                                                                                                                                                                                1473
                                                                                                                                                                                                                                                                      40207
                                                                                                                                                                                                                                                                                                                  40147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   873
                                                                                                                                                                                40327
                                                                                                                                                                                                                           40267
                                                                                                                                                                                                                                                                                                                                                                                                        40028
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              813
```

```
JOURNAL
MEDLINE
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 11
PFMAL3P5/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뭥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                 REFERENCE
                                                                                                                                                                                                                                                                                                                                           SOURCE
                                                                                                                                                                                                                                                                                                                                                                              KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COCUS
                                                                                                               TITLE
                                                                                                                                                                                                                                                                   AUTHORS
                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  41164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               40747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aaaacggaattaaaatattaactttaaaaataaaaaatttgagta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agtagtaatatacattaagcaaattttaaaaaaattatataagcctatacgcgctcaaagt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aatagttggtgaattcaatatctccattaatattttttgaaatctacaaattattaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                attttttttttttggaacaagaaataacagatagaaaactatttgttgtggaatgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aatttttgaaaaatgttataatttctaacaatattattaaaatatgatgcctataatgta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       atgttatctagtaggtgtaattaataatgcatggtgcgattcagaattgggacaacaatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TATAATTAAATTTAATTATATAACATTTATTATTATTTAATTTAATTTATAATTAAT--ATTTAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tttcctatgttcttaaaaatatttttttttatatttagttataaatacattatgaaccaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTAAATAATATATTTAAATTTAATTATATAATATTTATTATTTAATTTAATTTAATTA 40746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          aattcaatgctactatcaatagaagaaacagctgagtattacattttaattttaaagacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTAATTAAATAATATATTTAAATTTAATTATATATATTATTACATTTATTTATTTATTTA 40686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tgacagcototacaactgtga-----tagtcaatttttttctgcaaatattaaattagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgaaaatgtaacccttttact----catagattaattaccgtatgtttttgttgccataa
                                                                                                                                            Bowman,S., Lawson,D., Basham,D., Brown,D., Chillingworth,T., Churcher,C.M., Craig,A., Davies,R.M, Devlin,K., Feltwell,T., Chercher,C.M., Craig,A., Davies,R.M, Devlin,K., Feltwell,T., Cherles,S., Gwilliam,R., Hamlin,N., Harris,D., Holroyd,S., Hornsby,T., Horrocks,P., Jagels,K., Jassal,B., Kyes,S., McLean,J., Moule,S., Mungall,K., Murphy,L., Oliver,K., Quail,M.A., Rajandream,M.-A., Rutter,S., Skelton,J., Squares,R., Squares,S., Suston,J.E., Whitehead,S., Woodward,J.R., Newbold,C. and
                                                                                                                                                                                                                                                                                                                                                                                            PEMAL3P5 86827 bp DNA
Plasmodium falciparum MAL3P5, complete sequence.
AL034556 AL008971 AL008972 AL008978 AL010141 ALC
AL010206 AL010210 AL139179
AL034556.3 GI:7711064
                                                                                                                                                                                                                                                                                                                  HTG; centromere; CTRP protein; initiation Serine/threonine protein phosphatase. malaria parasite P. falciparum. Plasmodium falciparum
Bowman, S., Skelton, J., Barrell, B.
                                                        99376085
                                                                                                               The complete nucleotide sequence of chromosome 3 of Plasmodium
                                                                                                                                  Barrell,B.G.
                                                                                                                                                                                                                                                                                                  Eukaryota; Alveolata; Apicomplexa; Haemosporida; Plasmodium
                                                                        Nature 400 (6744),
                                                                                             falciparum
                                   (bases 1 to 86827)
                                                                                                                                                                                                                                                                               (bases 1 to 86827)
                                                                          532-538
                   Churcher, C.,
                                                                          (1999)
                   Lawson, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  41210
                   Quail, M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      04-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          41044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            41163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2060
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             40806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1940
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    41104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            40924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     40864
```

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CB10 1sA, UK
On May 5, 2000 this sequence version replaced gi:4493931.
For more information about this sequence or the Malaria Project, see http://www.sanger.ac.uk/Projects/P_falciparum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lawson,D., Bowman,S. and Barrell,B.

Direct Submission
Submitted (17-DEC-1998) P.falciparum Genome Sequencing Consortium,
The Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1
                                                                                                                                                                                                                                                                                                                                                                                                                           PRC0575W (review, 16644)

complement(3354...6644)

/gene="PPC0580c, MAL3P5.2"

/gene="PPC0580c, MAL3P5.2"

/note="PPC0580c (MAL3P5.2), Hypothetical protein, len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /uote="predicted splice acceptor sequence (revised of PFC0575w)"
1024. .1029
                                                                       /db_xref="SPTREMBL:097257"

/tabslation="MLGLKRKNVFYLLVSVPSLFAYFLKRHKDNENNYETLINNNDIE
KIKK IRIHNKCSYIPLLFLNIYDSYIYKNKILRWLYFKFRKRKKDKEEYYYITIMWYK
KRREAIKYNFISDEQNLFNKFYIYEIYLEYSLKYGILSPHLSLYILKNISEHCVNIYP
SLYYYNKLDNKHNLINEKKLKYFKQINNEHTQQAPTNHTHHNNNNNKKPLDINIHSC
KNTNISSYSTYNNMEKENINIYDKYNHHFYTEKSISYKDENCOHITLMMIYLLNQTY
DNICRICLNTNTNIYINFWHINIKKYLCKYNMEIILLNWIYKLNQTY
DNICRICLNTNTNIYINFWHINIKKYLTOKKNHEIILLNWIYKNISDNY
KYJSFFFKKEENHIYDLEDQMMHLHKKENDKFYNYSHENTHNNIYKYISDNY
LFKYIYSFFFKKEENHIYDLEDQMMHLHKKENDKFYNYSHENTHNNIYKYISDNY
FYDHINSSSNRCFKNLKKQQTDDNTKHIINGKEKYPMNKSDHEKKNNNTCGNINIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              604.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FTMKLNIERNNKNIIRSNYDNINNDISIDKDMYMNNPIDVNINNISLDEKIKEQFENP DDEMLKELKDTYEQFOLFNDMIIKY EEDQPLYNINDNSNIHDNUNNITMKKNKKKIK DDENIKELKDTYEQFOLFNDMIIKY EEDQPLYNINDNSNIHDNUNNITMKKNKKKIK DTYNDDDDYDY EKEEDLYIQK NIDDY IY KNTIGMNKSILEFKNÇFIEKD DYNDDDDYDY EKEEDLYIQK NIDDY IY KNTIGMNELIQNEMNFIK NIDNNISND SNNULDQHGRWKSNDEMYKSTEHIKNKNTINKOY DTELLQNQMENNFIK NIDNNISND ISNNEINIIKKKLNQSDEDINLTSDLIYERLRTKVLWYIQK IEYLKFKYQYD II NEQ YPIIKNEKTVLDLINQSDEDINLTSDLIYERLRTKVLWYIQK IEYLKFKYQYD II NEQ YPIIKNEKTVLDLINYGYKIYSKNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="mylknvyiyisscfilfdlcfsfhllkmkyknhmnnmksvtffl
rspqiyrkrekrstinvsfkkkokelflenlkkofsflofernnyvdokyjddvis
ninnltrikoytikkksneeftenlkqilltoyfskidekiinnlsyiikhepmsnit
vhstlnoisekvkekkdaenvlalhlellkdenitlesmmhimdfekskokviecird
ikskkrkknnsiyinlfictilyftycmclllkyishlcifffffcfelcynller
iyeecvgdlirkkierynlycekkkikfhmkdaikkmeinmkdddlyfnyhydellro
                        DQKKDILKKIYFLKGNKLDDIQILNELYVMIYMRLLFECSLKLISIKKNIHLLEKKME
FDKDNKIIYLNSADYMNNLRRNILKRFSKNEERENINSFASFPFLLSKNIIYFEDEIG
                                                                                                                                                                                                                                                                                                                /product="Hypothetical protein,
/protein_id="CAB38968.1"
/db_xref="GI:4493932"
                                                                                                                                                                                                                                                                                                                                                                                                                         1097 aa, possible signal sequence, hexexon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="predicted splice donor sequence
PFC0575w (revised)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PFC0575w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="Hypothetical protein,
/protein_id="CAB38969.2"
/db_xref="GI:7711065"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Join(322. .vu/,v=-
/gene="PFC0575w, MAL3P5.1"
/note="PFC0575w (MAL3P5.1), Hypothetical protein, len:
/note="PFC0575w (MAL3P5.1), Hypothetical protein, len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          I IMFNVM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOHN (JEEP PEC0575W, MAL3P5.1"
/gene="pec0575W, MAL3P5.1"
/oin/322. .603,826. .1023,1197. .1301,1458.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="Plasmodium falciparum"
/strain="3D7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="predicted splice
PFC0575w (revised)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="taxon:5833"
/chromosome="3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="SPTREMBL:097258"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'clone="MAL3P5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               to 86827)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .603,826.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .26. .1023,1197. .1301,1458.
MAL3P5.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      donor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PFC0575w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cambridge
misc_feature
                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                   misc_feature
                                                                                                                                                                                                                                                                                                                                                                                             misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   misc_feature
```

```
join(7669. .7717,7800. .7829,7912.

8302. .8358,8568. .8641,8713. .8811

9369. .9505,9613. .9838)

/gene="prc0581w"

join(7669. .7717,7800. .7829,7912.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JULII (1869. .7717,7800. .7829,7912. .7940,8064. .8106,8302. .8368,8568. .8641,8713. .8812,8924. .9006,9122. 9369. .9505,9613. .9838)
//gene="PFC0581w"
//note="npc0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VINNICSNNNNNICSNNNNNICSNNNNNICSNKMLDEFCQDNKFNDYMTRKKEKRI YELAK I YTNNIEDYLKGKKEKIQDNVITINLYYIKKKEK PWIFYLKNII KNKDTSFIEH NNNI VRGDIKNNNI FEKKYNLFESSIISYFYIKDIYEYNYKLRLYYIYDNLIKKFE YFLKMNEHINRKLYKMKRAFHYYIYNFDQFIINNYYHIIHKKNIHKHIHLKQCKDKE YFLKMNEHINRKLYKMKRAFHYYIYNFDQFIINNYYHIIHKKNIHKHIHLKQCKDKE DDIVKFKDLYYCMINNINNIFSYIHKVDHNECYVRIFKAYNKLLYEYNYLDHLLKFYYKNLKKYKYTYLNNISDLYPYNISYNKIVONYKKNRKNFSHIFYSLKUDHLLKFLYTQRIQNCCDIFSYIYKKYNFNEFLNYLYYELHYIVYSEKKKKKKFFSFISSSP
                                                                                                                                                                            /translation="MKKKKHYFSIKFVNVDKNKYVLCSKDYIRIINYMIGLHIFRLL
QKIFHLYFANRQIASSFFESHKNYRVTREDIIDGIEKCWFNITDYLISESIKONDFS
NDIKFTVTAMKNKHODLLTTSYSNKKIDTVNASFQWAQSPEYIFLNIKFSHRWSSGS
LKVKDEEIVSKKNNFSFSALSNDSNSVTKKYIVDLTLLDNIIESETKYNFASVGKVVV
                                                                                                                                                                                                                                                                                                    /product="hypothetical protein, PFC0581w"
/protein_id="CAB90285.1"
/db_xref="GI:7711066"
                                                                                                                                                                                                                                                                                                                                                                                                                                tentative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="PFC0581w, hypothetical protein,
revised: new gene prediction, splicing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MVVCGPKT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YSYDTMVNSFTESYFFESLSYLLFILFYHPDMYASYIFFKTLTYSGLPTYYYSLYNNI
                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
.7835
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7912. .7940,8064. .8106, .8812,8924. .9006,9122.
                                                                                                                                                                                                                                                                                                                                                                                                                                                          len: 324 aa
prediction
                                                       for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          324
                                                       exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                very
                                                       N
                                                       of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .9258
```

TLKKEKKIMNRLLLSKEKYPNMOVMMDMKEKRIHITFVTINLFFLLSLSHRYHDSV QNFLKEEKNNSDKLQDDIDEDEEKYFDEEILREAKKKSEEYDKDDEEL\* 7790. 7799 /note="potential PFC0581w" /note="potential prc0581w" 7901. .7911 PFC0581w 7830. /note="potential splice acceptor sequence
PFC0581w" /note="potential splice splice splice donor sequence acceptor sequence donor sequence for for for exon exon exon 3 of 2 of ω of

8055. .8063 /note="potential PFC0581w" splice acceptor sequence for exon 4 of

8107. .8112 /note="potential PFC0581w" .8301 splice donor sequence for exon for exon 4 of

8369. /note="potential PFC0581w" .8374 splice splice donor sequence acceptor sequence for exon Ġ of S of

8559. /note-"potential PFC0581w" /note="potential PFC0581w" .8567 splice acceptor sequence for exon σ of

8704. .8712 /note="potential PFC0581w" splice donor sequence for exon 6 of

PFC0581w" /note="potential .8818 splice acceptor sequence for exon · 7 of

/note-"potential: PFC0581w" /note="potential PFC0581w" 9112. .9121 PFC0581w" note="potential" .9012 splice splice splice donor sequence acceptor donor sequence sequence for for for exon exon exon 8 of 8 of

9

of.

```
, B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 1023;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       41351
41000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  41171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                41231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     41291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cagcaaattattaacaagagtattgagaaaaaccgaaaaataagaaaaagggaaagagtag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAAATATACATATAAATTAAATTAAATATAATATTAAT-----AATTAAGTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     attgttataacaaaatatctatctttggtatatgagaaaatatggagtttggaatttata 227
                                          tgacccatggagtatgtgaataattatcaaagagaataagagatgacaaccaaaaggttg
                                                                                                                                     acgagtgtgaatatccgtttatcgatcactccaatcatgattatgattcttgtgctaatc
                                                                                                                                                                                                                                                                                                                                                                                                            TAACTATATATATATATATAAAAAAAATTAATTATATATAATTAGATTTAATTATAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ttggttctggattaggtttatttgatcataattacatgcatcatttctttgattactatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ataataaaggaaataatcgattccatttggttggattacacagttaagttttgtgtttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note-"potential splice acceptor sequence ppr(0581.W" 9259. .9264 /note-"potential splice donor sequence for ppr(0581.W" pr(0581.W" 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(join(10024. .10044,10320. .10336,10397. .10445,
10613. .10674,10773. .10798,10929. .10999,11157. .11237,
11453. .11515,11715. .11767,11950. .12040))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(join(10024. .10044,10320. .10336,10397. .10445,
10613. .10674,10773. .10798,10929. .10999,11157. .11237,
11453. .11515,11715. .11767,11950. .12040))
/gene="PFC0582c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="potential splice
PFC0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9506. .9511
/note="potential splice
PFC0581w"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9361. .9368
/note="potential splice
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="PFC0582c, hypothetical protein, len: revised: new gene prediction"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PFC0581v
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="hypothetical protein,
/protein_id="CAB90286.1"
/db_xref="GI:7711067"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="PFC0582c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  44.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .9612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 125.4; DB 96; Length 86827; 
Pred. No. 2.5e-08; 
0; Mismatches 1266; Indels 38; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            accetor sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                acceptor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              donor sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10
                                                                                                                                                                                                                                                                       40881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              41001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              41121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10;
```

Š В Š

밁 δ 밁 맑

Š В ş

밁 δÃ В

Ş 밁 ş В

Ş

```
Š
                                                                                     δÃ
                                                                                                            밁
                                                                                                                                 Š
                                                                                                                                                                            δÃ
                                                                                                                                                                                                   밁
                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
 Ş
                                                                   밁
                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                         40110
                                                                                                                                                                                                                                                                                                                                                                               40222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                40402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      705
                                                                                                                                                                           taatgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacat 1603
                                                                                                                                                                                                                  ttacagtttcgaagtcctctacaagcgtgtaaccatctgcaactattaaattgctttctt
                                                                                                                                                                                                                                               TAAATATGATAATTATATATAATTAAATTAATAATTAAAATGAATTAATTAATTTATT
                                                                                                                                                                                                                                                         aaaagaaaacgatttttcttggattccattcaatgatctaaaatgcatagatcttttggg
                                                                                                                                                                                                                                                                                                                                                aatagttatgtgatgtcgataaatgaaattcacacgcgtggtaataattatggggaccgta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctcgacccttaaaatacgattttacagcgtcactagttgagattactagcataaagcata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAAATTAAATAATATTAATTAAATAAATACTTAATAAGTATATAATAATTAAATTAA
ccttttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaac 1843
                                                                   aacttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttg
                                                                                                                        tgttacgatcactgcaaatatcattcttggttggtcaacaataaaaaacaaaaacaagaaa
                                                                                                                                                                                                                                                                                                                                                                              ttaacatatccatatatgggtatgctatacctttcacgtatgctatactagagactaaag
                                                                                                                                                                                                                                                                                                                                                                                                                          TATATTATAATAATTATATAATAATAATTAATTAATTTAATTAAATTAAATTAAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gaaaattttggaattaccggttgttatgtaaatatagatttagtggta-aacaaatatgt 1183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aaaacaattgtctgggaccattttgaataaactttttctcaaacattacgggacactgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tttgtttcgtttctctttaactatattatcgcggatatatgataacaatgatatatcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tggatattcgttaaaatttgcgataacgattgtgaaaaatattttatttgttagctgatc
                       tggaataatggtccctgccagctttctctcacaatcaatatcgaccctatttggattttc
                                                                                                                                                                                                                                                                                                                                   1483
                                                                                                                                                                                                                                                                                                             1423
                                                                                                                                                                                                                                                                                                                                                         1363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1004
                                                                                         1723
                                                                                                                                    1663
                                                                                                                                                                                                   39931
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   40283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                40703
                       39700
                                                                                                                                                                                                                         1543
                                                                                                                                                                                                                                                                                                                                   40111
                                                                                                                                                                                                                                                                                                                                                                                                                                               1243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                40343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    40463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               40523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          40583
                                                                                                              39812
                                                                                                                                                        39872
                                                                                                                                                                                                                                                                                         40051
                                                                                                                                                                                                                                                                                                                                                                              40165
                                                                                                                                                                                                                                                                                                                                                                                                                          40223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          40403
```

```
taactttaaaataaataaaaatttgagtaaatgtgttttctgactat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ttaa--taatgcatggtgcgattcagaattgggacaacaatgaaaacggaattaaaatat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tccattaatattttttgaaatctacaaattattaatatttagtcaataacaatgcataga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttttttatatttagttataaatacattatgaaccaataatagttggtgaattcaaatatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tctaacaatattattaaaatatgatgcctataatgtatttcctatgttcttaaaatattt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        agaaacagctgagtattacattttaatttaaagacaaaatttttgaaaaatgttataatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tgtgatagtcaattttttctgcaaatattaaaattaggaattcaatgctactatcaataga
||||||||||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mitochondrion Drosophila melanogaster
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insec
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insec
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 4601)
Lewis, D.L., Farr, C.L., Farquhar, A.L. and Kaguni, L.S.
Sequence, Organization and Evolution of the A+T Region of
Drosophila melanogaster Mitochondrial DNA
Mol. Biol. Evol. 11, 523-538 (1994)
                                                                                                                                                                                                                                                                                                                                            mitochondrial DNA; A+T region; tandem repeats
                                                                                                                                                                                                                                                                                                                                                            U11584.1 GI:508826
                                                                                                                                                                                                                                                                                                                                                                                          Drosophila melanogaster
                                                                                          Submitted (28-JUN-1994) Laurie S. Kaguni Ph.D, Dept. of Biochemistry, Michigan State University, East Lansing, MI,
                                                                                                                         Direct Submission
                                                                                                                                                          (bases 1 to 4601)
 /organism="Drosophila melanogaster"
/organelle="mitochondrion"
/strain="Oregon-R"
                                               1. .4601
                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                        4601 bp
                                                                                                                                                                                                                                                                                                                                                                                          Oregon-R mitochondrial A+T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2425
                                                                                                                                                                                                                                                                                                                                                                                                          23-JUL-1994
                                                                                                                                                                                                                                                                                                Insecta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      39341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               39461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3922
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             39521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         39583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3910:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3916:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           39281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   39401
                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                            Qy
                                                                                            밁
                                                                                                                        δ.
                                                                                                                                                      В
                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 1027;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity
                                                                                                                                                                                                                                                                                  2398
                                                                                                                                                                                                                                                                                                                                                                                                          2278
                                                                                                                                                          2516
                                                                                                                                                                                                                    2456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     repeat_unit
                                                                                                                                                                                                                                                   246
 486
                                                                                                                           366
                                                                                                                                                                                                                                                                                                                                                                                                                                       99
                                                                                                                                                                                                                                                                                                                                                                                                                             tgttcacatgatttgagtttggttctcaatttggattccaagataattaaaatattaaaat 125
                                                                                                                                                                                                                                      gattccatttggttggattacacagttaagtttttgtgtttctttttgtttatatgtatatg
                                                                                                                                                                                                                                                                                                                                                                 tcatttaaaatatttacaagtaattaattatctttacattgtattgttataacaaaatat 185
agtaaatcaaaaagagtattgattgaagtgtaaacatatttcgttatgacccccaaaaaa 365
                                                                                                                                                                                                                    tatttgatcataattacatgcatcatttctttgattactatgaagattttcttaccaatt 485
                                                                                            ATATATAGAAAAATTA---
                                                                                                                    aaaaaaaaaaacaaacaaacaaaacccccccccccgatatagtttttggttctggattaggtt 425
                                                                                                                                                          2271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="repeat II-C"
/rpt_type=tandem
/rpt_type=tandem
complement(4565. .4585)
/note="deoxythymidylate stretch"
131 c 74 g 2125 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="taxon:7227"
/dev_stage="embryo"
650. .1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /rpt_type=tandem 3113. .3576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /rpt_type=tandem 2491. .2511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /rpt_type=tandem 4041. .4504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /rpt_type=tandem
3577. .4040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /rpt_type=tandem 2649. .3112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /rpt_type=tandem
1361. .1705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /rpt_type=tandem
1023. .1360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="repeat I-B2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="repeat I-A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          note="repeat II-B2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        note="repeat II-B1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="repeat II-A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /partia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="deoxythymidylate
2512. .2648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="repeat I-C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /rpt_type=tandem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /rpt_type=tandem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="repeat I-C/A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'note="repeat I-B1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .4040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2043
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 124.4; DB 6;
Pred. No. 4.9e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches 1276;
                                                                                            ----AATTATTTAAATAATTTAATATAAATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   stretch"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 4601;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                2455
                                                                                                                                                                                                                                                                                                                                            2397
 545
                                                                                                                                                        2575
                                                                                                                                                                                                                    2515
                                                                                                                                                                                                                                                 305
                                                                                                                                                                                                                                                                                                                                                                                                          2337
                                                                                            2620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10;
```

REFERENCE AUTHORS

SOURCE

fruit fly.

ORGANISM

KEYWORDS VERSION ACCESSION DEFINITION ocus

REFERENCE

MEDLINE JOURNAL TITLE

AUTHORS TITLE JOURNAL

Kaguni,L.S. 94285822

FEATURES

18824-1318,

source

RESULT 1

12

QΥ 맖 Ş Вþ Qy 밁 Qy 밁

39160

39220

В

39100

Qy

2144

39340

Qy 밁 Ş.

₽,

39400

Qy

рь δÃ B Q В

39580

1904

39640

В

```
₽
                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                             24
                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       å.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                            3401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3041
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         724
tgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacattac
                                                                    agtttcgaagtcctctacaagcgtgtaaccatctgcaactattaaattgctttct-ttaa
                                                                                                                                          gaaaacgatttttcttggattccattcaatgatctaaaatgcatagatcttttgggttac
                                                                                                                                                                                                                                                              atgtgatgtcgataaatgaaattcacacgcgtggtaataatt---atgggaccgtatgtt
                                                                                                                                                                                                                                                                                                                              atccatatatgggtatgctatacctttcacgtatgctatactagagactaaagaatagtt
                                                                                                                                                                                                                                                                                                                                                                                           ttagtggtcaacatatacataattccttacagaaaaaacaaaacttaagagaagttaacat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aaatacgattttacagcgtcactagttgagattactagcataaagcataaaggacccgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAAAAATAATTTTTTTTTAAAAAAAAACTATATACTAATTATAAATTAATAGATATTTA
                                                                                                             tttggaattaccggttgttatgtaaatatagatttagtggtaaacaaatatgttaatcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agctttctctcacaatcaatatcgaccctatttggattttctggatattcgttaaaattt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         attgagaaaaaccgaaaataagaaaagggaaagagtagtgacccatggagtatgtgaat
                                                                                                                                                                             AAAAAATATTTATATAAAAAAATCATGTTTTTAAAAAAATAAACAAAAATTTTTAATAA
                                                                                                                                                                                                                                          AAATTATTTAAATAATTTAATATAAAATTTTTTAAAAATTTCTTAAATGTATTATTTTTAT
                                                                                                                                                                                                                                                                                                          AAATAAAAATTTTAAAATTTAAAAATGTAGATATAATTTATAAAAATTTATATTCTCAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ca----agctatttatacaaagttacaaactgaatatagcttgaaatcctttagaaaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AATGTATTATTATAAAAAATATTTATATAAAAAATCATGTTTTTAAAAAAATAAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     taactatatattatcgcggatatat----gataacaatgatatatcacaaaacaattgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TAATTAATTATATATATATATAAATTTATATATTATTGAATATTTATATATATATATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gcgataacgattgtgaaa--aatattttatttgttagctgatctcaatattatgt-tcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATATATCTAATAATTTAAATAAAAAATTTTAAAAATTTAAAAATGTAGATATAATTTATAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aattatcaaagagaataagagatgacaaccaaaaggttgtggaataatggtccctgcc--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAAAAATTTTTAATAAATAAATTTTATAATGAAATATAATTTATTTATTTTTCAATTTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ctgggaccattttgaataaactttttctcaaacattacgggacactggactcgaccctta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | togatcactccaatcatgattatgattcttgtgctaatccagcaaattattaacaagagt
                                                                                                                                                                                                           1427
                                                                                                                                                                                                                                         3580
              1606
                                                                              1546
                                                                                                                                           1487
                                                                                                                                                                             3640
                                                                                                                                                                                                                                                                          1367
                                                                                                                                                                                                                                                                                                                                                                                                       1250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2800
```

Š

Q

Ωy 밁 οy 밁 δÃ 밁 δÃ

```
멍
                                                             Š
                                                                                  Ъ
                                                                                                    Qy
                                                                                                                          밁
                                                                                                                                                                밁
                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                   ò
                                                                                                                                           δÃ
                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                4300
                                                                                                                                                                                                         4240
                                                                                                                                                                                                                                                                                        4120
                                                                                                                                                                                                                                                                                                                               4060
                                                                                                                                                                                                                                                                                                                                                                        4000
1847
                                                                                                                                                                                                                                                                                                                                                                                                               3941
                                                                                                                                                                                                                                                                                                                                                                                                                                   1727
                                                                                                                                                                                                                                                                                                                                                                                                                                                       3881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3761
             taacagatagaaaactatttgttgtggaatggaagtagtaatatacattaagcaaattt
                                                                                                                        TAATATAATGATTTAATTAATTATATATATTATAAATTTATATATATTATTGAATATTTA
                                                                                                                                      attaatattttttgaaatctacaaattattaatatttagtcaataacaatgcatagaaag
                                                                                                                                                                                                       TTAATATATTATTATATATCTAATAATTTAAATAAAAATTTTAAAATTTAAAAATATAG
                                                                                                                                                                                                                  tttatatttagttataaatacattatgaaccaataatagttggtgaattcaaaatatctcc
                                                                                                                                                                                                                                              aacaatattattaaaatatgatgcctataatgtatttcctatgttcttaaaatatttttt
                                                                                                                                                                                                                                                                                                        aacagctgagtattacattttaatttaaagacaaaatttttgaaaaatgttataatttct
                                                                                                                                                                                                                                                                                                                                         gatagtcaattttttctgcaaatattaaattaggaattcaatgctactatcaatagaaga
                                                                                                                                                                                                                                                                                                                                                                                                             TTTAATATAAATTTTTTAAAAATTTCTTAAATGTATTATTTTTATAAAAAATATTTATAT
                                                                                                                                                                                                                                                                                                                                                                                         tttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaactgt 1846
                                                                                                                                                                                                                                                                                                                                                                                                                               tattttcgcgatgcatgaaggataaacctaatgactttaattttttgaaaatgtaaccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttgtct
                                                                                                     2266
                     2386
                                         4539
                                                                                  4479
                                                                                                                         4419
                                                                                                                                                                4359
                                                                                                                                                                                   2146
                                                                                                                                                                                                                          2086
                                                                                                                                                                                                                                              4239
                                                                                                                                                                                                                                                                   2026
                                                                                                                                                                                                                                                                                      4179
                                                                                                                                                                                                                                                                                                          1966
                                                                                                                                                                                                                                                                                                                             4119
                                                                                                                                                                                                                                                                                                                                                                      4059
                                                                                                                                                                                                                                                                                                                                                                                                             3999
                                                                                                                                                                                                                                                                                                                                                                                                                                                     3940
```

SOURCE ORGANISM RESULT 1 DMU37541 REFERENCE KEYWORDS VERSION ACCESSION DEFINITION LOCUS JOURNAL MEDLINE AUTHORS Mitochondrion Drosophila melanogaster
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda;
Pterygota; Neoptera; Endopteryota; Diptera; Brachyos
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
1 (bases 18511 to 12682) Drosophila melanogaster .U37541 .U37541.1 GI:1166529 Drosophila mitochondrial DNA: a novel Nucleic Acids Res. 10 (21), 6619-6637 83090428 Wolstenholme, D.R. Clary, D.O., Goddard, J.M., DMU37541 19517 đđ DNA cir Martin, S.C., circular INV 02-Nete mitochondrial genome

02-MAR-2001

gene order Fauron, C.M.

QY 밁 Qy 밁 δÃ В δÃ 밁 Qy

```
JOURNAL
MEDLINE
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
MEDLINE
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
MEDLINE
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
MEDLINE
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAL
MEDLINE
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE
                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AUTHORS
                                                                                                    tRNA
                                                                                                                                           tRNA
                                                                                                                                                                                tRNA
                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mol. Biol
88174373
                                                                                                                                                                                                                                                                                                                                                        Submitted (03-OCT-1995) Laurie S. Kaguni, Biochemistry Department, Michigan State University, East Lansing, MI 48824-1319, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Lewis D.L., Farr, C.L. and Kaguni, L.S.
Drosophila melanogaster mitochondrial DNA: completion
nucleotide sequence and evolutionary comparisons
Insect Mol. Biol. 4 (4), 263-278 (1995)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8 (bases 14917 to 19517)
Lewis, D.L., Farr, C.L., Farquhar, A.L. and Kaguni, L.S.
Sequence, organization, and evolution of the A+T region of
Drosophila melanogaster mitochondrial DNA
Mol. Biol. Evol. 11 (3), 523-538 (1994)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Evidence from 12S ribosomal RNA sequences that onychophorans are modified arthropods Science 258 (5086), 1345-1348 (1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7 (bases 14215 to 14512)
Ballard, J.W., Olsen, G.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Drosophila melanogaster mitochondrial DNA: gene organization and evolutionary considerations Genetics 118 (4), 649-663 (1988)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Satta, Y., Ishiwa, H. and Chigusa, S.I.
Analysis of nucleotide substitutions of mitochondrial DNAs
Drosophila melanogaster and its sibling species
Mol. Biol. Evol. 4 (6), 638-650 (1987)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              genetic code
Nature 304 (5923),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            de Bruijn, M.H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Clary,D.O., Wahleithner,J.A. and Wolstenholme,D.R. Transfer RNA genes in Drosophila mitochondrial DNA: related
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2 (bases 5)
Clary, D.O.,
                                                                                                                                                                                                                                                                                                                                                                                                 Lewis, D.L., Farr, C.L. and Kaguni, L.S. Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                            96423163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           94285822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Atkinson, P.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   91088557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      melanogaster subgroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Evolution of Drosophila mitochondrial DNA and the history
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Satta, Y. and Takahata, N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      88212147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Garesse, R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              83245048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Drosophila melanogaster mitochondrial DNA, a novel organization and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Nucleic Acids Res. 11 (8), 2411-2425 (1983)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        flanking sequences and comparisons to mammalian mitochondrial tRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 5268 to 13619)
                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1 to 19517)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 5269 to 5695)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 408; 13319 to 19517)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 441 to 2967)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 804 to 1778)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (bases 404 to 5272)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Natl. Acad. Sci. U.S.A. 87 (24), 9558-9562 (1990)
                                                                                                  complement(97. .165)
/product="tRNA-Gln"
171. .239
                                                                                                                                                                                                sequences; sequence is a composite containing sequences obtained from different Drosophila melanogaster strains
                                                                                                                                                                                                                                                          /organism="Drosophila melanogaster"
/organelle="mitochondrion"
/db_xref="taxon:7227"
/transl_table=5
/product="NADH dehydrogenase subunit
                                      /codon_start=1
                                                                             /product="tRNA-Phe
                                                                                                                                                           /product="tRNA-Ile"
                                                                                                                                                                                                                                     /note="derived from new and previously submitted
                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
1. .19517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                234-241 (1983)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Faith, D.P., Odgers, W.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rowell, D.M. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the
                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                   tRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                        tRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         trna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       trna
```

```
/product="cytochrome c oxidase subunit I"
/protoch_id="AAC47812.2"
/protoch_id="AAC47812.2"
/db_xref="G1:7412849"
/translation="MSRQWLFSTNHKDIGTLYFIFGAWAGMYGTSLSILIRAELGHPG
/translation="MSRQWLFSTNHKDIGTGYFIFGAWAGMYGTSLSILIRAELGHPG
ALIGDDQIYNVIVTAHAFIMIFFMYWPIMIGGFGNWLPPLMGAFDWAFPRWNNMSFW
LLPPALSLLLVSSMYENGAGFMYVYPPLSAGIAHGSSVDLAIFSLHAFISHISITGA
VNETTTYVINWRSTGISLDRWPLFWYYPTALLLLLSLPVLAGAITMLLTDRWLNTSW
VNETTTYVINWRSTGISLDRWPLFVYSILILPGFGMISHIISQESGKKETFGSLGMIYAM
LAIGLLGFIWAHHETVGMUYDTRAYFTSAMMIANPTGIXIFSWLATLTDRYSS
DAIGLLGFIWAHHETVGMUYDTRAYFTSAMMIANPTGIXIFSWLATLTGUYS
/product="ATPase 6"
/protein_1d="AAC47815.1"
/protein_1d="AAC47815.1"
/db_xref="GI:116534"
/db_xref="GI:1166534"
/translation="MMTDHESVFDPLAIFNFSLNWLSTFLGLLMIPSIYWLMPSRYNI
MWNSTLLTLHKEFKTLLGNGSSPSIFISLFSLILFNNFMGLFPYIFTSTSHLTLT
LSLALPLWLCFMLYGWINHTQHMFAHLVPQGTPAILMPFMVCIETISNIIRPGTLAVR
LSLALPLWLCFMLYGWINHTQHMFAHLVPQGTPAILMPFMVCIETISNIIRPGTLAVR
LSLANNIAGHLLLTLLGNTGSSMSYMLMTFLLMAQIALLVLESAVAMIQSYVFAVLSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="tRNA-Asp"
3907. .4068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="tRNA-Lys" 3840. .3906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QWYWSYEYSDENNIEFDSYMIPTNELMTDGFRLLDVDNRVVLPMNSQIRILVTAADVI
HSWTYPALGYKVDGTPGRLNQTNFFINRPGLFYGQCSEICGANHSFMPIVIESVPVNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="cytochrome c oxidase subunit
/protein_id="AAC47813.1"
/db_xref="GI:1166532"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3083. .3767
/note="TAA stop codon
residues to the mRNA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PAILWALGFVFLFTVGGLTGVVLANSSVDIILHDTYYVVAHFHYVLSMGAVFAIMAGF
IHWYPLFTGLTLNNKWLKSHFIIMFIGVNLTFFPQHFLGLAGMPRRYSDYPDAYTTWN
IVSTIGSTISLLGILFFFFIIWESLVSQRQVIYPIQLNSSIEWYQNTPPAEHSYSELP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(1403.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(1322. .1 /product="trNA-Cys"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAIGGLNQTSLRKLMAFSSINHLGWMLSSLMISESIWLILFFFYSFLSFVLTFMFNIF
                                                                                                                                                                                                                                                                                                                                                                                     /product="ATPase 8"
/protein_id="AAC47814.1"
/db_xref="GI:1166533"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FIKWISSNNS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_except=(pos:3767,aa:TERM)
/transl_table=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="tRNA-Leu"
3083. .3767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SLFYFMF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="mfnnsskilfitmligtlitvtsnswlgawmgleinllsfipl
LSDNnnLmsTeaslkyflTqVLasTvLlfssillmLknnmnneinesftsmlimsall
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LFFNNYVNRFLLHGQLIEMIWTILPAIILLFIALPSLRLLYLLDEINEPSVTLKSIGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       first codon uncertain"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="tRNA-Trp"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IMMMSTLITLFFYLRICYSAFMMNYFENNWIMKMNMNSINYNMYMIMTFFSIFGLFLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KLFHLNQLFSWFVNSKILKFTLFMNFLSLGGLPPFLGFLPKWLVIQQLTLCNQYFMLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LKSGAAPFHFWFPNMMEGLTWMNALMLMTWQKIAPLMLISYLNIKYLLLISVILSVII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /protein_id="AAC47811.1"
/db_xref="GI:1166530"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         transl_table=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 join(1470. .1472,1474. .3009
/note="mechanism underlying
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="tRNA-Tyr"
                                                                                                                                                                                                                              /transl_table=5
                                                                                                                                                                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                       translation="MPQMAPISWLLLFIIFSITFILFCSINYYSYMPNSPKSNELKNI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              translation="MSTWANLGLQDSASPLMEQLIFFHDHALLILVMITVLVGYLMFM/
                                                                                                                                                                                                                                                                                               .4736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .1468)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .1383)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . 3009)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                completed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 reading
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    frame shift after
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ц
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       addition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of.
```

```
Matches 1027;
                                                                                                                                                                                                                                  17432
                                                                                                                                                                                                                                                                                                                   17372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 trna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        trna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  trna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         trna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             trna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match 1.8%;
Local Similarity 43.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                        AATTTTTAAATTTTAATAATAAATAAATTTAATAATTAATAATTAAATAAATCTATTCA 17313
tatttgatcataattacatgcatcatttctttgattactatgaagattttcttaccaatt
                                                                                                                                                ATATATAGAAAAATTA-
                                                                                                                                                                                aaaaaaaaaacaaacaaacaaaccccccccccccgatatagtttttggttctggattaggtt 425
                                                                                                                                                                                                                              agtaaatcaaaaagagtattgattgaagtgtaaacatatttcgttatgacccccaaaaaa 365
                                                                                                                                                                                                                                                                                                                 gattccatttggttggattacacagttaagtttttgtgtttctttttgttatatgtatatg
                                                                                                                                                                                                                                                                                                                                                                                                tcatttaaaatatttacaagtaattaattatctttacattgtattgttataacaaaatat 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tgttcacatgatttgagtttggttctcaatttggattccaagataattaaaatattaaaat 125
                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
/transl=trable=5
/product="cytochrome c oxidase subunit III"
/protein_id="aAc47816.1"
/protein_id="aAc47816.1"
/db_xref="GI:116535"
/db_xref="GI:116535"
/translation="MSTHSNHPFHLVDYSPWPLTGAIGAMTTVSGMVKWFHQYDISLF
VLGNIITILTVYQWWRDVSREGTYQGLHTYAVTIGLRWGMILFILSEVLFFVSFFWAF
FHSSLSANIELGASWPPMGIISFNPFQIPLLWTAILASGVTYWAHHSLMENNHSQT
TQGLFFTVLLGIYFTLAQAEVIFAPFTIADSIYGSTFFMANGGFHGIHVLIGTTFLLV
CLLRHLNNHFSKNHHFGFEAAAWYWHFVDVVMLFLYITIYWMGG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(6401. 8124)
/note="TAA stop codon is completed by
residue to the mRNA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="tRNA-Glu"
complement(6337..6401)
/product="tRNA-Phe"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="tRNA-Ser"
6252. .6318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="tRNA-Asn"
6184. .6251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="tRNA-Arg"
6119. .6183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GLYHEWNQGMLNWSN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="tRNA-Gly" 5608. .5961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PKSSSRLPFSLRFFLITIIFLIFDVETALILPMIIIMKYSNIMIWTITSIIFILILLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="NAH dehydrogenase subunit 3"
/protein_id="AAC47817.1"
/db_xref="Gi:1166536"
/translation="MFSIIFIALLILLITTIVMFLASILSKKALIDREKSSPFECGFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_except=(pos:complement(6401. .6402),aa:TERM)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="tRNA-Ala"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            transl_table=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .6118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . 6045
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 124.4; DB 6;
Pred. No. 4.1e-08;
0; Mismatches 1276;
                                                                                                                                             AATTATTTAAATAATTTAATATAAATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 19517;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the addition
                                                                                                    485
                                                                                                                                                                                                                                                                                                                                                        305
                                                                                                                                             17536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ų
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10;
```

γQ

β 8 8

```
Ş
                                                        Вþ
                                                                                  2
                                                                                                                 멍
                                                                                                                                            δÃ
                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                рь
                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                γo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ωy
밁
                                                                                                                                                                            뫄
                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
18677
                                                                                                                                                                                                                                                                                                                                                           18317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             784
                                                                                                                                                                                                                                                      atgtgatgtcgataaatgaaattcacacgcgtggtaataatt---atgggaccgtatgtt 1367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TATATATATAAATATTTAATATTATTATATCTAATAATTTAAAATAAAAATTTTAA
                                                                                                                                                                                          acgatcactgcaaatatcattcttggttggtcaacaataaaaacaaaaaacaagaaaaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ca----agctatttatacaaagttacaaactgaatatagcttgaaatcctttagaaaat 1130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aaatacgattttacagcgtcactagttgagattactagcataaagcataaaggacccgtt 1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              taactatattatcgcggatatat----gataacaatgatatatcacaaaaccaattgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            agctttctctcacaatcaatatcgaccctatttggattttctggatattcgttaaaattt 783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              attgagaaaaaaccgaaaataagaaaaagggaaagagtagtgacccatggagtatgtgaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTTTTAAAAAATAAACAAAAAATTTTTAATAAATAAATTTTATAATGAAATATAATTTAT
                       tgcatctttaacatatttattgttagttggaatttaataagagcgaacttgtaacattac 1606
                                                         AAAAAATAATTTTTTTTTAAAAAAAAACTATATACTAATTATAAAATTAATAGATATTTA
                                                                            agtttcgaagtcctctacaagcgtgtaaccatctgcaactattaaattgctttct-ttaa
                                                                                                                   gaaaacgatttttcttggattccattcaatgatctaaaatgcatagatcttttgggttac
                                                                                                                                                                            AAAAAATATTTATATAATAAAATCATGTTTTTAAAAAATAAACAAAAATTTTTAATAA
                                                                                                                                                                                                                                                                                                atccatatatgggtatgctatacctttcacgtatgctatactagagactaaagaatagtt
                                                                                                                                                                                                                                                                                                                                                           AAATAAAAATTTTAAAAATTTAAAAATGTAGATATAATTTATAAAAATTTATATTCTCAT
                                                                                                                                                                                                                                                                                                                                                                                                                                      tttggaattaccggttgttatgtaaatatagatttagtggtaaacaaatatgttaatcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAAAAATTTTTAATAAATAAATTTTATAATGAAATATAATTTATTTATTTTCAATTTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgggaccattttgaataaactttttctcaaacattacgggacactggactcgaccctta 1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AATGTATTATTTTTATAAAAAATATTTATATAATAAAAATCATGTTTTTTAAAAAATAAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcgataacgattgtgaaa--aatattttatttgttagctgatctcaatattatgt-tcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATATATCTAATAATTTAAATAAAAAATTTTAAAAATTTAAAAATGTAGATATAATTTATAA 17836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aattatcaaagagaataagagatgacaaccaaaaggttgtggaataatggtccctgcc--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             togatcactccaatcatgattatgattcttgtgctaatccagcaaattattaacaagagt
                                                                                                                                                                                                        1427
18736
                                                                                                                                             1487
                                                                                                                                                                            18556
                                                                                                                                                                                                                                                                                                                                                                                                                                                  1190
                                                                                     1546
                                                                                                                   18616
                                                                                                                                                                                                                                                                                                                             1310
                                                                                                                                                                                                                                                                                                                                                           18376
                                                                                                                                                                                                                                                                                                                                                                                        1250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         17896
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         665
                                                                                                                                                                                                                                        18496
                                                                                                                                                                                                                                                                                                 18436
                                                                                                                                                                                                                                                                                                                                                                                                                      18316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 723
```

```
ACCESSION
VERSION
                                                                                                                                                                                          RESULT 14
PFMAL1P3/c
                                                                                                                        SOURCE
                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                 γ
                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                    Db
                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ġ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
             COMMENT
                                                                                         REFERENCE
                                                                                                                                   KEYWORDS
                                                                                                                                                                      DEFINITION
                                                                                                                                                                                 LOCUS
                                             TITLE
JOURNAL
                                                                                                               ORGANISM
                                                                               AUTHORS
                                                                                                                                                                                                                                      19456
                                                                                                                                                                                                                                                                                                                                                                         19276
                                                                                                                                                                                                                                                                                                                                                                                                                    19216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18737
                                                                                                                                                                                                                                                                                   19396
                                                                                                                                                                                                                                                                                                                              19336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18916
                                                                                                                                                                                                                                                             2327
                                                                                                                                                                                                                                                  atgcatggtgcgattcagaattgggacaacaatgaaaacggaattaaaatattaacttta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aacaatattattaaaatatgatgcctataatgtatttcctatgttctttaaaaatatttttt 2026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     taaaaaattatataagcctatacgcgctcaaagtatgttatctagtaggtgtaattaaata
                                                                                                                                                                                                                                                                                                                            taacagatagaaaactattttgttgtggaatggaagtagtaatatacattaagcaaattt
                                                                                                                                                                                                                                                                                                                                                                        attaatattttttgaaatctacaaattattaatatttagtcaataacaatgcatagaaag 2146
                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTAATATATTATTATATATCTAATAATTAAATAAAAAATTTTAAAAATTTAAAAATATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tttatatttagttataaatacattatgaaccaataatagttggtgaattcaaatatctcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gatagtcaattttttctgcaaatattaaaattaggaattcaatgctactatcaatagaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTTAATATAAATTTTTTAAAAATTTCTTAAAATGTATTATTTTTTATAAAAAATATTTATAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tttactcatagattaattaccgtatgtttttgttgccataatgacagcctctacaactgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tattttcgcgatgcatgaaggataaacctaatgactttaattttttgaaaatgtaaccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ttaatcttgtttcttcctacggtataaatattaatcatcgaggtaaaaaaagttttgtct 1726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               On 1
                                                                                                   Plasmodium
Eukaryota;
                                                                                                                                      HTG
                                                                                                                                                          Plasmodium
AL031746
                                             Submitted (24-SEP-1998)
                                                                   and Barrell, B.
                                                                              Bowman, S.,
                                                                                                                         malaria parasite P. falciparum
                                                                                                                                               AL031746.9
                                                                                                                                                                                PFMAL1P3
                                                      Direct Submission
             Dec
                                                                                         karyota; Alveolata;
(bases 1 to 67970)
  more
                                   Sanger
                        1SA,
            16,
 information about this sequence
                                                                             Churcher, C.,
                                                                                                            falciparum
                                                                                                                                                                    falciparum MAL1P3,
                                   Centre,
            1999 this
                                                                                                                                                GI:6594243
                                                                                                                                                                                67970 bp
                                   Wellcome
sequence version replaced gi:5763807. about this sequence or the Malaria Project,
                                                                                                   Apicomplexa;
                                            P.falciparum Genome
                                                                                                                                                                                DNA
                                                                             Harris, B.,
                                   Trust
                                                                                                                                                                    complete
                                 Genome
                                                                             Harris, D.,
                                                                                                   Haemosporida;
                                                                                                                                                                   sequence
                                 Campus,
                                           Sequencing
                                                                             Lawson, D.,
                                 Hinxton,
                                                                                                   Plasmodium
                                                                                                                                                                                15-DEC-1999
                                            Consortium,
                                                                             Quail, M.
                                 Cambriage
                                                                                                                                                                                                                                      19515
                                                                                                                                                                                                                                                           2386
                                                                                                                                                                                                                                                                                                                                                  2266
                                                                                                                                                                                                                                                                                                                                                                                                                                                              19215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1666
                                                                                                                                                                                                                                                                                 19455
                                                                                                                                                                                                                                                                                                                                                                        19335
                                                                                                                                                                                                                                                                                                                                                                                              2206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19095
```

```
FEATURES
                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          see http://www.sanger.ac.uk/Projects/P_falciparum. IMPORTA sequence is unfinished and does not necessarily represent correct sequence. Work on the sequence is in progress and release of this data is based on the understanding that the sequence may change as work continues. The sequence may be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sequence may change as work continues. The seque contaminated with foreign sequence from E.coli,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          etc.
NHLQNPDAFYNTYRKFSSQTEIDEISRDFLSIGKNASSSSSGIKNNNKNIDNNKFVEN
DYIINFIKSTKKMEKDSLNENRSLPNVNIYNIMFSDVPSVTFEVTSCINLFNVFVKIF
                                                               /translation="MTTYKENVGISNKGNKKKKSCQNISFLNFLSFDWIRPLINDLIK
GDIQELPNICRNFDVPYYASKLEENLRDIEVEDSEFYSEKNSSNEHVLHHCNSNDASE
KKVYNVYYHNILWSILKTFKFRIILIISFYILETLIVTLGGKFIDYYMRILEGQKIPV
                                                                                                                                                                                                                                                                                                           /note="possible 14884. .20352
                                                                                                                                                                                                                                                                                                                                                                                              /translation="mKLLNNRFVVLCPIIILFFFLNSVVLGNNNRNNINFHETENAAKARKKLLSGEINSIKLDNGDELKIKLNDEKHKDSTKWDKSYSFISNLEEEKYSQTDLFRKKQEINEANTKIIEDRQEFYILNNDEIENIATRFVLENNFDELYIQSFKQSLIDIIQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5005.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="potential splice
complement(2742...2747)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NEKDKEYLENLKNKIIKYPNRIVCIGEIGLDFDRLYFCSKYIQIKYFIFQLKLVQMFN
LPMFLHMRNCSETFFKIVDIYKFLFEKNGGVIHSFTDKEDIVHIIVQNYKNLYIGVNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NNNVDKIIITCTCLAEIDKSLKICETYDPEGKFLYLSAGVHPTNCYEFIDKNKHEEKE
IIAKKEYEEFIKYFKNEQVENSKMENGNKKICDGEKDMNNLNEILLEKNLDTIPGFKY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="conserved hyprotein_id="CAB63556
/db_xref="GI:6594244"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aa, similarity: UPF0006 family eg to
YBL055C/YBL0512/YBL0511, YBF5_YEAST (418 aa),
SCOTES: OPT: 316, E(): 1.1e-12, (33.2% identi
overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="MAL1P3.01"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(join(1748.
/gene="MAL1P3.01"
                                                                                                                              /product="putative ABC transporter"
/protein_id="CAB63558.1"
/db_xref="GI:6594246"
                                                                                                                                                                                                                                                               /gene="MAL1P3.03"
14884. .20352
                                                                                                                                                                                                                                                                                                                                                          8020.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="hypothetical protein, MALIP3
/protein_id="CAB63557.1"
/db_xref="GI:6594245"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(2984.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="potential splice
complement(2849. .2861)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement (2599.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CSLKSLENINAVKKIPLNLLLLETDAPWCGVKKTHASYEYIKDTYEKRAYTNLKKIKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LQIKKRSNLKKNHNIRKMEDNESSFIDIGSNLTDKMFDGVYNSKKHENDLQNVLNRAK
                                           YISFLKDFKVFSGLVVVMIMFFHLFFEALLHFYFHLFTINLKVSLMYFLYKINLCSNN
                                                                                                                                                                                                                    /gene="MAL1P3.03"
/note="MAL1P3.03,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  contains possible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="potential
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              translation="MKLVFHYIKYINVLFYISIIFLKSNSLKIYNDLRYISTVNKYKV/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Plasmodium
/strain="3D7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             I I KCDDNT I FKERNEPYNIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="MAL1P3.01,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /chromosome="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="taxon:5833"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    note="MAL1P3.02,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="MAL1P3.02"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="MAL1P3.02"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'note="potential
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .5496
                                                                                                                                                                                                                                                                                                                                                          .10389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            splice
.2989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   splice
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .2610)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               hypothetical protein, signal sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            conserved hypothetical protein, len:
                                                                                                                                                                                                                         putative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           hypothetical protein, 56.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    falciparum'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .2598,2748. .2848,2990.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .2598,2748.
                                                                                                                                                                                                                                                                                                                                 region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            acceptor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  acceptor sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    donor sequence, atg/gttaaa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                donor sequence,
                                                                                                                                                                                                                         ABC
                                                                                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                       transporter,
                                                                                                                                                                                                                                                                                                                                 very
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .2848,2990.
                                                                                                                                                                                                                                                                                                                               high
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             identity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aaa/gtaaaa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               UPF0006 family"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IMPORTANT:
                                                                                                                                                                                                                                                                                                                                 [A+T]
                                                                                                                                                                                                                         Len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 fasta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .3276))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ĺ'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the
                                                                                                                                                                                                                         1822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This
                                                                                                                                                                                                                         aa 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              412
```

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_feature
                                                                         misc_feature
                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IDYTRIKLFDEVELNIHVKHSNKMIYKEAYFVKGNTESVSFEIDSINKEYIKKMKKKNY
KKEHMMKUNKONUNUNSNKODHINIMMODHFRUYKDINLGESTODSFTVSSLGNE
YTLDTYTSNNSDKEEIVKPLYKDTHEEFINKSSSMPFVKSSSMMINNPSNFKYEDNSSS
FKGSISLETYLMYFQOQFOLLTSVUIFMLISIFTDEIKFVFLIMMSIISKNIKEHSD
TILQKQVRYLEYFVILPIISLVTSGICFSMIIYGNITSAIKVHNNILYSILNAPLYIF
YNNNLGNIINRFIIDISAFDYGFLKRIYKAFFFFFCILSSLLIIYMIRDCIFJFFFY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MFKYFFFYHKMNYHKNIINKQILSGLLKNVDDNTNKKICFQEHKSNSTYNYNSSHIHE
KKEEYENIHNSSNSTMSDEFKEKKNNBYIIKLENCSFGLSYDMKCDNDHILKNINFN
LKRUSLAIILGUNGSGGSAFFHSILGDFNMTHGNLY EUFFKKMPILYYPQUSNLFMG
NIRSMILFGNEYNPLIYKYTILQSELLNDLSTIEHGDMKYINDDHNLSKGQKVRICLA
RALYEHYIHMHKLCTDYEKKLIQPNEILDKDLINKNISSYNMKSKLVNYNIFPNEN
YLQKCLMDDNMFYLYLLDLITTSLDSSISKKTEDNISFKDMSSFILSMNS
TLDNFILEDILDNVQYEVNIFEIQDKTLKYRGNISEYMEKNNLNITKESHWGYSNLNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(32477. .32486)
/note="potential splice acceptor sequence" .
complement(32669. .32674)
/note="potential splice acceptor sequence" .
/note="potential splice acceptor sequence, ana/gtatat"
join(3657. .36743,36864. .37343)
/gene="MALIP3.05"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KKIPLVNGTYKYIDEBPSLKNINMYALKNOKTOIVGKSGAGKSTILLSIIGLINISOG
KITVEGRDIRTYNRKGEDSIIGILAGQSSFVFYNNNIRTFIDPYNNFTDDEIVHALKLN
GINLGKNDLYKYMHKODMKSNYKKIIOTSKVINOSNDNTILLTNDCIRYLSLVRLYLN
RHKYKIILIDEIPIFNLNNSVHDELNSFLIGKAKSFNYIIRNHFPNNTVLIISHHANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MSFYVFHIKIGSNSVGIAIWLSIALYSAMILFEFLPSLFKSKYLIYRDKRIDNMHHVL
KEFKLIKMFNWBSFAFKYINIFRMKEMKYCKIRLJSNIGVFISSISSDIVEVVIFFI
YLKDBLNKKEBIKFTSIIMPLYVYKILISNNAMFPNLKNUMKBGIVNIKRLNNYINDI
LYYNDIKNYFMYRTRYNBDYNIVVDKTFLQNENITSHDDGTSHNLKHLKNVIKNKLTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="MALIP3.04, conserved hypothetical membrane protein, len: 203 aa, similarity: P. falciparum chromosome 2, PFB0110W, 096126 predicted integral membrane protein (255 aa), fasta scores: opt: 335, E(): 4.9e-15, (36.1% identity in 191 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(join(31966. .32476,32675. .32775))
/gene="MALIP3.04"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="region containing small subunit, 5.8S and large
subunit rRNA genes and spacer regions"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IILIYFFVFKRFSRGCKEAQRLYLSCHTPLCNIYSNALSGKNIINIYKKNTYHLDVYE
HYINNFRISYFFKWLINIWASLYIKIFILLLTTYIIMHPHLYASGIIKLYKEKNYVRI
/note="potential splice acceptor sequence"
complement(join(38049. .39995,40210. .4028
                                                                                                                                                                                                                               /translation="mrikmnsgiffikllicisficvfecfnkcmisyrkdllwysen
Cfnysidrslaegssesketkvkdipniellkslninyeeyekmkeivgsfmdnnnln
IanevlknihsftnienifslindsskspvlktflkefgsifphmlnnvpkllfdlcQ
                                                                                                                                                                                                                                                                                                                                                /product="hypothetical protein, MAL1P3.05"
/protein_id="CAB63560.1"
/db_xref="GI:6594248"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HDKEETITTWIKWIQEDIEYFLFNLQVEWLRILTLELFYKNKE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="mkkSytfinvTillfltllfltyynyDTfSkTkfnnnikIDin
RfkRliaeaseeQkyPweeDfClilneeeLirPehnDSPYLPEHYENIDKinELSINS
TKIWkETIKKMRQNYEKETDNMNHNWRDFMWHYKWANIYLYKVHKLINITLKDLTNPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MAL1P3.04"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(join(31966. .32476,32675. .32775))
/gene="MALLP3.04"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="rRNA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LSTLGYCISFSARLGVIIKFLLCDYTHIEKEMCCVQRLEEFAKISNKENASMNKENEL
NVITTQTYKEKNENISDKISAIVEYKNVSLSSIINSSQDDESKKKYGIKFENVYVSYK
                                                                                                                                                          36744.
                                                                                                                                                                                              RNPLHIILGLIVILAAIYVFENFKNFEC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /protein_id="CAB63559.1"
/db_xref="GI:6594247"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="rRNA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               23896
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LSCCDYIYVLRKGEITYRCSYEDVKTQSELSHLLEMDD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="MAL1P3.05"
/note="MAL1P3.05, hypothetical protein, len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   )oin(36657.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="conserved hypothetical membrane protein,
                                                                                                                 'note="potential splice donor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      codon_start=]
                                                                                                                                                              .36749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .36743,36864. .37343)
                                                                                                                     sequence,
```

gene

CDS

gene

**TRNA** 

gene

CDS

```
δÃ
                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                     20
                                                                                   В
                                                                                                                          δÃ
                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                             Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity Matches 1043; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                             10373
                                                                                                                                                                                                                                                                                                                                                       10194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_feature
141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         201
                                                                                                                                                                                                                                                                                                                                                                                                   259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               81 agtttggttctcaatttggattccaagataattaaatattaaaatttcatttaaaatattt 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TATTATTAATTAAATATAAAATTAATATTTAAATAAGTAAAAATATATTAATTTATTTA 10016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ttacatgcatcatttctttgattactatgaagattttctttaccaattaaaaatttcgaatt
                                                                                                                                                                                                                                                               tggattacacagttaagtttttgtgttttcttttgttatatgtatatgagtaaatcaaaaa 318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             catatctcttgattattaaattaaat---acgagtgtgaatatccgtttatcgatcactc
                                                                                     acaaacaaaccccccccccgatatagtttttggttctggattaggtttatttgatcataa
                                                                                                                                                                                                                                                                                                                                                       TAATAATAATAATACATAATATAAATTAATTAATTATAAATA-ATAATTTCATTATAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                THI INVIDENDENSYDKKEDKKEKKHKKEKKEKKEKKEKKEKKEKKHKKEKKHKKE
DKKEESKOKKEKKHKEKEKKHKK
DKKEESKOKELTKEGHKEKEKKHKKEKKHKKE
DKKEESKOKELTKEGHKEKEKHKEEKELT
DKKEESKOKELTKEGHKEKKATEHGEBLYEESHKELDKEKEKOKGEKEKKEGE
QGGGIISSVHETSNOTKONDKENISBOKKEDHOOEEMLKTLDKKERKOKEKEKKEGE
KIEKKKKOEKEKKOEKKERKOEKKEHKOKEHKOK IEKERKKEEKEKKKE
KIEKKKKOEKEKKOEKKEKKOEKKEKKOKKEKHKOK IEKERKKEEKEKKKK
HDKENEETMOOEDOTSETTNIBIMVPLDSPLTUTTPECHKEGEEHKEEHKEGEHKEG
EHKEEEHKEEHKKEHKSKEHKSKGKOKGKINKAKKEKKKKKKKEEKKEEKLSIQ
EOLIGTIGRUNVPRRDNHKKKMAKIEBAELOKOKHUDKEEDKKEESKEVEEESKEULSIQ
EOLIGTIGRUNVPRRDNHKKKMAKIEBAELOKOKHUDKEEDKKEESKEVEEESKEUL
EOLIGTIGRUNVPRRDNHKKKMAKIEBAELOKOKHUDKEEDKEEESKEVEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="potential splice acceptor sequence" complement(40204. 40209) /note="potential splice donor sequence, aag/gtaaca" /note="potential splice donor sequence, aag/gtaaca" join(45401. 46396,46562. .50233)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /protein_id="CAB63561.1"
/db_xref="GI:6594249"
/transja+i^~="".
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="meqigiannifteigknivkrsgpfeiwrkkfieevskkisnsl
nienikeckkncrkinymmddkeeefvskkffvyeyitsnvwknefekaiintlknkt
ktclrsrkkypkeiänimgeledyidaindykkqfknlycwseryidykkwlnemkey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(39996. .40005)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(join(38049.
/gene="garp"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DDDAEEDDDDAEEDDDEDEDEDEEEEEEEEEEEEKKIKRNLRKNAKI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="mnvLfLSyNICILFFVVCTLNFSTKCFSNGLLKNQNILNKSFDS
ITGRLLNETELEKNKDDNSKSETLLKEEKDEKDDVPTTSNDNLKNAHNNNEISSSTDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         identity in 678 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="hypothetical protein, MAL1P3.07"
/protein_id="CAB63562.1"
/db_xref="GI:6594250"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <u>EDEEEVEEDEEEEEEEEEEEEEEEEEEEEEEEEEDEVEEDEDDAEEDEDDAEEDEDDAEED</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="MAL1P3.06, garp, len: 673 aa, similarity:
identical to GARP_PLAFF (678 aa), fasta scores:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      codon_start•1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="MAL1P3.07, hypothetical protein,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               join(45401. .46396,46562. .50233)
/gene="MAL1P3.07"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="MAL1P3.07"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 123.4; DB 96; Pred. No. 4.9e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches 1281;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .39995,40210.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   673 aa, similarity:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .40284))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            67970;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97.6%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
9896
                                                                                                                                                                                                                       438
                                                                                                                                    498
                                                                                                                                                                                                                                                                   10076
                                                                                                                                                                                                                                                                                                               378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10255
                                                                                                                                                                                                                                                                                                                                                         10136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12;
```

8.8

Ωy

밁 QΥ DЪ ρ 망 QΥ

1628 8825	ttagttggaatttaataagagogaacttgtaacattacaatatttatattagatactagt	1569 8882
1568 8883	cgtgtaaccatctgcaactattaaattgctttctttaatgcatctttaacatatttatt	1509 8942
1508 8943	ccattcaatgatctaaaatgcatagatcttttgggttacagtttcgaagtcctctacaag	1449 9002
1448 9003	tggtcaacaataaaaacaaaaacaagaaaaaaagaaaacgatttttcttggatt	1395 9062
1394 9063	acacgcgtggtaataattatgggaccgtatgttacgatcactgcaaatatcattcttggt	1335 9122
1334 9123	ttcacgtatgctatactagagactaa-agaatagttatgtgatgtcgataaatgaaattc 	1276 9182
1275 9183	Cttacagaaaaaacaaacttaagagaagttaaccatatccatatatgggtatgctatacct	1216 92 <b>4</b> 2
1215 9243	atatagatttagtggtaaacaaatatgttaatcaattagtggtcaacatatacataattc	1156 9302
1155 9303	acaaactgaatatagcttgaaatcctttagaaaattttggaattaccggttgttatgtaa 	1096 9362
1095 9363	actagttgagattactagcataaagcataaaggacccgttcaagctatttatacaaagtt	1036 9422
1035 9423	Ctttttctcaaacattacgggacactggactcgacccttaaaatacgattttacagcgtc	976 9481
975 9482	gcggatatatgataacaatgatatatcacaaaacaattgtctgggaccattttgaataaa	916 9541
915 9542	ttctgtttaaagcatattttgtctttctttttgtttcgtttctctttaactatattatc	9601
855 9602	gtgaaaaatattttatttgttagctgatctcaatattatgttccaggtatttgcataatc 	796 9661
795 9662	CAATCAATATGACCCTATTTAGGATTTCTGATATAAAAATATTAATAATAATAAAAATAATAATAATA	736 9716
735 9717	gagaataagagatgacaaccaaaaggttgtggaataatggtccctgccagctttctctca 	676 9775
675 9776	aaccgaaaataagaaaagggaaagagtagtgacccatggagtatgtgaataattatcaaa 	616 9835
615 9836	caatcatgattatgattcttgtgctaatccagcaaattattaacaagagtattgagaaaa 	556 9895

QΥ

Qy 밁 Q

g

δõ

밁

8 ₽

밁

```
RESULT 15
DMU11584/c
                                밁
                                             δÃ
                                                              Вb
                                                                           QΥ
                                                                                            밁
                                                                                                          δÃ
                                                                                                                            밁
                                                                                                                                          δõ
                                                                                                                                                           밁
                                                                                                                                                                         Q
                                                                                                                                                                                         Вþ
                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                   δã
                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                  р
                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                    8644
                                                                                                                                                                                                                                                                                                                                                                                  8704
                                                                                                                                                                                                                                                                                                                                                                                                                  8764
                                8044
                                                              8104
                                                                                             8164
                                                                                                                             8224
                                                                                                                                                           8284
                                                                                                                                                                                          8344
                                                                                                                                                                                                         2102
                                                                                                                                                                                                                         8404
                                                                                                                                                                                                                                                       8464
                                                                                                                                                                                                                                                                       1982
                                                                                                                                                                                                                                                                                       8524
                                                                                                                                                                                                                                                                                                     1929
                                                                                                                                                                                                                                                                                                                      8584
                                                                                                                                                                                                                                                                                                                                                                  1809
                                                                                                                                                                                                                                                                                                                                                                                                  1749
                                                                                                                                                                                                                                                                                                                                                                                                                                 1689
                                               2401
                                                                             2341
                                                                                                             2281
                                                                                                                                            2222
                                                                                                                                                                          2162
                                                                                                                                                                                                                                        2042
                                                                                                                                                                                                                                                                                                                                    1869
                                TTAATTATTTATT 8030
                                                                                                                            tattttgttgtggaatggaa-gtagtaatatacattaagcaaattttaaaaaaattatatat
                                                                                                                                                                                                  aaatacattatgaaccaataatagttggtgaattcaaatatctccattaatattttttga
                                                                                                                                                                                                                                                       ATTATATTAATTATTTAATATAATAATAGTTTATTTAATTATATATATATATTAAT
                                                                                                                                                                                                                                                                                               atttaaagacaaaatttttgaaaa-----atgttataatttctaacaatattattaaa
                                                                                                                                                                                                                                                                                                                     tatgtttttgttgccataatgacagcctctacaactgtgatagtcaattttttctgcaaa
                                                                                                                                                                                                                                                                                                                                                                                            atgtgattattccaaatacatactttggatgtttaaactttaatcttgtttcttcctacgg
                                        ttgagtaaatgtgtt
                                                                                                           tgttaacagaaacttccaaatttttttttttttatggaacaagaaataacagatagaaaac
                                                                                                                                                                                                                                                                                                                                   tattaaattaggaattcaatgctactatcaatagaagaaacagctgagtattacatttta
                                                                                                                                                                                                                                                                                                                                                   AATTTATATATTTAACATTTTATTTAATTTTAATATATATATATATTTTATTTATTA
                                                                                                                                                                                                                                                                                                                                                                                                                           tataaatattaatcatcgaggtaaaaaaagttttgtcttattttcgcgatgcatgaagga
                                                                                                                                                                                                                                                                                                                                                                                                                                                2415
                                                              8045
                                                                                                            2340
                                                                                                                            8165
                                                                                                                                                                          2221
                                                                                                                                                                                         8285
                                                                                                                                                                                                         2161
                                                                                                                                                                                                                         8345
                                                                                                                                                                                                                                        2101
                                                                                                                                                                                                                                                       8405
                                                                                                                                                                                                                                                                      2041
                                                                                                                                                                                                                                                                                      8465
                                                                                                                                                                                                                                                                                                     1981
                                                                                                                                                                                                                                                                                                                     8525
                                                                                                                                                                                                                                                                                                                                    1928
                                                                                                                                                                                                                                                                                                                                                                  1868
                                                                                                                                                                                                                                                                                                                                                                                  8645
                                                                                                                                                                                                                                                                                                                                                                                                                  8705
                                                                                                                                                                                                                                                                                                                                                                                                                                                8765
                                                                                             8105
```

REFERENCE AUTHORS TITLE VERSION KEYWORDS SOURCE ORGANISM LOCUS
DEFINITION
ACCESSION ON Drosophila melanogaster Oregon-R mitochondrial A+T region.

Wil1584

Wil1584.1 GI:508826

Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insect.

Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;

Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;

Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

E 1 (Dases 1 to 4601)

Sequence, Organization and Evolution of the A+T Region of Drosophila melanogaster Mitochondrial DNA DMU11584 4601 bp melanogaster DNA Oregon-R INV mitochondrial

region

Insecta;

of.

. 뭐

밁 Š Ъ ρy В QY Qγ

δÃ

В

δÃ

밁

δõ

밁 γQ 밁

В

3541

382

```
REFERENCE
AUTHORS
                                                                                              δÃ
                                                                                                                             В
                                                                                                                                                     Ş
                 밁
                                           Š
                                                                       밁
                                                                                                                                                                                   밁
                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                            BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOURNAL
MEDLINE
                                                                                                                                                                                                                                       Query Match 1.8%;
Best Local Similarity 44.1%;
Matches 1045; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                              3767
                                                                                                                                                                                                                                                                                                                                                 misc_feature
                 3653
                                                                                                                                                                                                                                                                                                                                                                                          repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                                                                                                                  repeat_unit
                                                                                                 203
                                                                                                                                                        143
                                                                                                                                                                                                             83
                                                                                                                                           TTATAAAATTTATTTATTAAAAATTTTTTTGTT-----
                                                                                                                           ATATATATAATATCTAT-----TAATTTATAATTAGTATATAGTTTTTTTTAAAAAA
                                                                                                                                                                                  Submitted (28-JUN-1994) Laurie S. Kaguni Ph.D, Dept. of Biochemistry, Michigan State University, East Lansing, 148824-1318, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mol. Biol. Evol. 11, 94285822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Kaguni, L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 4601)
                                                                                                                                                                                                                                                                                                                         2271
                                                                                                                                                                                                                                                                                                                   /rpt_type=tandem /rpt_type=tandem complement(4565. .4585) /note="deoxythymidylate a 131 c 74 g 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /rpt_type=tandem 2491. 2511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="repeat II-A"
/rpt_type=tandem
3113..3576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="repeat I-A"
/rpt_type=tandem
1023. .1360
                                                                                                                                                                                                                                                                                                                                                                                           /rpt_type=tandem
4041. .4504
                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="repeat II-B1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /rpt_type=tandem
1361. .1705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /strain="Oregon-R"
/db_xref="taxon:7227"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                             /note="repeat II-C"
                                                                                                                                                                                                                                                                                                                                                                                                                  /note="repeat II-B2"
                                                                                                                                                                                                                                                                                                                                                                                                                                   /rpt_type=tandem
3577. .4040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /rpt_type=tandem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      note-"deoxythymidylate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /rpt_type=tandem
1706. .2043
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'note="repeat I-C/A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="repeat I-B1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /dev_stage="embryo"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Drosophila melanogaster"
/organelle="mitochondrion"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note="repeat I-C"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rpt_type=tandem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'note="repeat I-B2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            . 2648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2388
                                                                                                                                                                                                                                      Score 122.6; DB 6;
Pred. No. 8.6e-08;
0; Mismatches 1284;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    523-538 (1994)
                                                                                                                                                                                                                                                                                                                         2125
                                                                                                                                                                                                                                                                                                                                    stretch"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        stretch"
                 TATTTTTAAAAAACATGATT
                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                  4601;
                                                                                                                                                                                                                                       42;
                                                                                                                                                                                                                                       Gaps
                                                                       3654
                                                                                                262
                                                                                                                             3714
                                                                                                                                                                                  3768
                                                                                                                                                                                                                                        11;
                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                   γ
                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
  Š
                              g
                                                      Ş
                                                                                    В
                                                                                                                                          밁
                                                                                                                                                                 Ωy
                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
  1401
                                                                                                                                          2705
                                                                                                                                                                                                                                                                               1101
                                                                                                                                                                                                                                                                                                           2885
                                                                                                                                                                                                                                                                                                                                                                                                                     3004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3480
                                                                                                                                                                                                                                                       2825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3540
                                                                                                                                                                                                                                                                                                                                                                                          983
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    323
                                                                                                                                                                                                             gatttagtggtaaacaaatatgttaatcaattagtggtcaacatatacataattccttac 1220
                                                                                                                                                                                                                                                                       ctgaatatagcttgaaatcctttagaaaattttggaattaccggttgttatgtaaatata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     atattttatttgttagctgatctcaatattatgttccaggtatttgcataatcttctgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aataagaaaagggaaagagtagtgacccatggagtatgtgaataattatcaaagaggaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 acaataaaaacaaaaaaaaaaaaaaaaaaaaaaacgatttttcttggattccattcaatgat 1460
                                                                                    gtatgctatactagagactaaagaatagttatgtgatgtcgataaatgaaattcacacgc
                                                                                                                                                         agaaaaaacaaacttaagagaagttaacatatccatatatgggtatgctatacctttcac 1280
                                                                                                                                                                                               TTTTTATTTAAATTATTAGATATAATAATATATTAAATATTTATATATATATAAATAT
                                                                                                                                                                                                                                                                                                                         ttgagattactagcataaagcataaaggacccgttcaagctatttatacaaagttacaaa 1100
                                                                                                                                                                                                                                                                                                                                                                                       tcaaacattacgggacactggactcgacc--cttaaaatacgattttacagcgtcactag 1040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TATTTTTATAAAAATAATACATTTAAGAAATTTTTAAAAAATTTATATATTAAATTATTTA 3065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TATTTTTTTAAAAAATTTTTTAAAAAAATTGAAAAATAAATAAATTATATTTCATTATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          agagatgacaaccaaaaggttgtggaataatggtccctgccagctttctctcacaatcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gattatgattcttgtgctaatccagcaaattattaacaagagtattgagaaaaaaccgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TAAATTAATAATAAATAAATATGAGAATATAAAT----TTTTATAAATTATATCTACATT 3365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           atgcatcatttctttgattactatgaagattttttcttaccaattaaaatttcgaattcata 502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 acaaacccccccccgatatagtttttggttctggattaggtttatttgatcataattac 442
                              TAAATAAATATGAGAATATAAATTTTTATAAATTATATCTACATTTTTAAATTTTAAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                     tatgataacaatgatatatcacaaaacaattgtctgggaccattttgaataaactttttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAATTTATTATTAAAAATTTTTTTTATTTTTTAAAAAACATGATTTTATTATAAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tatcgaccctatttggattttctggatattcgttaaaatttgcgataacgattgtgaaaa 802
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             totottgattattaaattaaaatacgagtgtgaatatccgtttatcgatcactccaatcat 562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTATTATATAAATATTTTTTATAAAAATAATACATTTAAGAAATTTTTAAAAAATTTATA
```

3125

742

682

622

862

922

982

1160

2826

2766

2706

2646

1400

Search completed: September 29, 2001, 11:28:01 Job time: 16690 sec

		•						
•			•		•			
•		•	•					
•								
	•							
•								
		•						
							•	
			·		,			
			·					
			·					
							•	
		·		 	 	_		_

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         on:
                                                                                                                                                                                                                                                                                           Pred: No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               seq length: 0
seq length: 2000000000
                                                                                                                                                                                                                                     %
Query
Match Length
                                                                                                                                                                                                                                                                                                                                            100.0

95.5

32.5

32.2

32.2

32.3

32.3

30.7

20.4

20.4

20.4

20.5

21.7

21.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             September 28, 2001, 18:43:30 ; Search time 27.59 Seconds (without alignments) 2460.039 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-502-426-2
2681
1 MFETEHHTLLPLLLLPSLLS.....FAFPFVDFPNGLPIRVSRIL 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SPTREMBL_16: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        425026 segs, 132305027 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                        sp_unclassified:*
sp_vertebrate:*
sp_virus:*
                                                                                                                                                                                                                                                                                                                                                                                                  sp_organelle:*
sp_phage:*
                                                                                                                                                                                                                                                                                                                                                                                                                                        sp_invertebrate:*
sp_mammal:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sp_archea:*
sp_bacteria:*
                                                                                                                                                                                                                                                                                                                                                                                                                          sp_mhc:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                              sp_human:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sp_fungi:*
                                                                                                                                                                                                                                                                                                                                                                               sp_rodent:*
                                                                                                                                                                                                                                                                                                                                                                                        sp_plant:*
  513
513
513
5124
524
524
524
457
465
466
466
465
735
518
463
463
463
463
463
463
463
                                                                                                                                                                                                                                       DВ
                                                                                                                                                                                                                                       H
  095489
095487
095487
095487
095489
02323
094066
09547
09547
09547
09547
09547
09547
09547
09547
09547
09547
09547
09547
09547
09547
                                                                                                                                                                                                                                                                        SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    425026
064989 arabidopsis
Q9scq phaseolus a
Q9scq phaseolus a
Q9fx29 arabidopsis
Q2142 arabidopsis
Q200066 arabidopsis
Q91073 arabidopsis
Q91165 arabidopsis
Q9165 arabidopsis
Q91676 arabidopsis
Q91676 arabidopsis
Q91676 arabidopsis
Q91678 arabidopsis
Q91678 arabidopsis
Q91678 arabidopsis
Q91678 arabidopsis
Q91678 arabidopsis
Q91178 arabidopsis
Q91177 arabidopsis
Q91169 arabidopsis
Q91169 arabidopsis
                                                                                                                                                                                                                                     Description
```

45	44	43	42	41	40	39	38	37	36	ω 5	34	ω W	32	31	30	29	28	27	26	25	24	23	22	21	20
300	300	305	317	321	329.5	338	357	369	398.5	435	439.5	442.5	444.5	446	461	479.5	497.5	518	547.5	569.5	575.5	577	579.5	579.5	581
•	•		11.8	12.0	12.3	12.6	13.3	13.8	14.9	16.2	16.4	16.5	16.6	16.6	17.2	17.9	18.6	19.3	20.4	21.2	21.5	21.5	21.6	21.6	21.7
513	491	501	483	497	517	453	518	349	375	224	492	525	492	512	497	444	460	504	489	477	464	455	485	474	496
10	11	11	10	13	G	N	UI	10	10	10	13	4	ű	4	11		-	10	10	10	10	10	10	10	10
Q9SBP8	Q64463	Q9QXF7	Q9FW33	Q9PVIO	017806	Q9KFA6	017807	Q9FWR7	Q9LN32	Q9SDM6	Q9PUB4	Q9NP41	093323	Q9NR63	Q9R1F4	Q59990	Q9SYN2	Q9SNG3	Q92V72	Q9LVY7	004949	8HX16	Q9SJH2	Q9SHY7	Q9FQY4
	Q64463 mus musculu		Q9fw33 oryza sativ	Q9pvi0 fundulus he	017806 caenorhabdi	Q9kfa6 bacillus ha	0		Q9ln32 arabidopsis		Q9pub4 gallus gall	Q9np41 homo sapien	093323 xenopus lae	Q9nr63 homo sapien	Q9r1f4 mus musculu	Q59990 synechocyst			Q9zv72 arabidopsis					Q9shy7 arabidopsis	Q9fqy4 cucurbita m

## ALIGNMENTS

9; PRELIMINARY; PRT; 513 AA. 9; G-1998 (TrEMBLrel. 07, Created) G-1998 (TrEMBLrel. 07, Last sequence update) G-1998 (TrEMBLrel. 07, Last sequence update) IT 22-ALPHA-HYDROXYLASE.  dopsis thaliana (Mouse-ear cress). yota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; cales; Brassicaceae; Arabidopsis. Itales; Brassicaceae; Arabidopsis.  NECE FROM N.A. N=WS-2; S., Dilkes B.P., Fujioka S., Takatsuto S., Sakurai A., ITAXID-3702; TAXID-3702; S., Dilkes B.P., Fujioka S., Takatsuto S., Sakurai A., ann K.A.; Cell 10:0-0(1998). Cell 10:0-0(1998). IMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY. AF044216; AAC05093.1; PRO0065; P450; 1. PRO01128; PRO00667; P450; 1. TE; PS000668; CYTOCHROME_P450; UNKNOWN_1. MONDOXY9ENASE; OXIGOREDIZE: NO. 6. 2e-183; TLCh 10:0-0%; Score 2681; DB 10; Length 513; al Similarity 100.0%; Pred. No. 6. 2e-183; 513; Conservative 0; Mismatches 0; Indels 0; G MEETEHHTULPLILLEPSILSILLFUILLKRRNEXTRENLPPGKSGWPFIGETIGYLKPYT MEETEHHTULPLILLEPSILSILLFUILLKRRNEXTRENLPPGKSGWPFIGETIGYLKPYT MEETEHHTULPLILLEPSILSILLFUILLKRRNEXTRENLPPGKSGWPFIGETIGYLKPYT ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILQNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILQNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILQNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILQNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILQNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILQNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILQNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILGNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILGNEGRLFECSYPRSIGGIL ATTLCDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNEFILGNEGRLFECSYPRSIGGIL ATTLCDFMQQNSIFSAQDEA																															
PRELIMINARY; PRT; 513 AA.  64989; 1-AUG-1998 (TrEMBLrel. 07, Created) 1-AUG-1998 (TrEMBLrel. 07, Last sequence update) 1-AUG-1998 (TrEMBLrel. 16, Last annotation update) 1-AUG-1998 (TrEMBLrel. 17, Last sequence update) 1-AUG-1998 (TrEMBLrel. 07, Last sunctation update) 1-AUG-1998 (TrEMBLREL 07, Last sunctation update) 1-AUG-1998 (TrEMBLREL 07, Last sunctation update) 1-AUG-1998 (TrEMBLREL 18,	Qy	Db Cy	:	Db	Qy	Ма	D Qu	K	S S	DR	DR	DR :	ב ה	2 5	7 5	7 X	RC	RP	RN	χ	8	8	გ	SO	GN ON	DE	ΡŢ	ij :	3 2	3 5	RESUI 06491
80 0,	GKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEA					513; Conservative 0; Mismatches 0; Indels 0; Gaps	100.0%; Score 2681; DB 10; Length	עדי ההי, שמסטי בותי,	nooxygenase; Oxidoreduc	PROSITE; PS00086; CYTOCHROME_P450; UNKNOWN_1.	Pfam; PF00067; p450; 1.	Interpro: IDR001128.	CI I OCHNOMB F400	TO THE CYTOCHROME P450	D1 = 10 - 0 - 0 - 10 0 0 0 0 0 0 0 0 0 0 0 0	Takatsuto S., Sakurai		SEQUENCE FROM N.A.	[1]	NCBI_TaxID=3702;	Brassicales; Brassicaceae; Arabidopsis.	Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;	Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;	Arabidopsis thaliana (Mouse-ear cress).	DWF4.	STEROID 22-ALPHA-HYDROXYLASE.	(TrEMBLrel. 16,		1000	PRELIMINARY; PRT;	

```
OCC EN MACOOC EN
  밁
                                           Q
                                                                                              뭐
                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        먕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                        Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Arabidopsis thaliana (Mouse-ear cress).

Eukaryota; VIridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
Brassicales; Brassicaceae; Arabidopsis.

NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                    EU Arabidopsis sequencing project;
Submitted (DEC-1999) to the EMBL/GenBank/DDBJ databases.
-!- SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
EMBL; AL132979; CAB62435.1; -.
Interpro; IPR001128; -.
                                                                                                                                                                                                                                                                                                       InterPro; IPR001128; -.
Pfam; PF00057; p450; 1.
PRINTS; PR00385; P450.
PROSITE; PS00086; CYTOCHROME_P450; UNKNOWN_1.
Heme; Monooxygenase; Oxidoreductase.
SEQUENCE 513 AA; 58867 MW; B1639BDD9A5D7C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
EU Arabidopsis seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-MAY-2000 (TrEMBLrel. 13, Created)
01-MAY-2000 (TrEMBLrel. 13, Last sequence update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Salanoubat M.;
Submitted (NOV-1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STEROID 22-ALPHA-HYDROXYLASE T3A5.40.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9SCQ9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                          Local Similarity
nes 512; Conserv
    61
                                                61
                                                                                                                                                                                                                                      Match
                                                                                       LKFNWELAEDDQPFAFPFVDFPNGLPIRVSRIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LKFNWELAEDDQPFAFPFVDFPNGLPIRVSRIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILK
                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mewes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  H.W.,
                                                                                                                                                                                                           99.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Lemcke K.,
                                                                                                                                                                                        Score 2677; D
Pred. No. 1.2e
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (DWF4).
                                                                                                                                                                                                                                                                                                          B1639BDD9A5D7C93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mayer K.F.X.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           513
                                                                                                                                                                                                           DB 10;
.2e-182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         databases
                                                                                                                                                                                                                                                                                                          CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Quetier
                                                                                                                                                                                                                                   Length
                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                      513;
                                                                                                                                                                                        0,
                                                                                                                                                                                   Gaps
                                                                                              60
                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             360
                                                                                                                                                                                     0;
```

QΥ

Matches

Conservative

Indels

44;

Gaps

10;

58 66

밁

```
RESULT
Q9LKH7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
           Query Match
Best Local (
                                                                                                        SIMILARITY).
-i- SIMILARITY: BELONGS TO THE C'
EMBL; AF279252; AAF89209.1; -.
Interpro: IPR001128; -.
Pfam; PF00067; p450; 2.
PRINTS; PR00385; P450.
                                                                                                                                                                                                                               SEQUENCE FROM N.A. STRAIN-CV. 2937; Yang M.T., Chen Y.M.; "Cloning and sequencin P450.";
                                                                                                                                                                                                                                                                                                                                                                                      Q9LKH7;
Q9LKH7;
Q1-OCT-2000
01-OCT-2000
01-MAR-2001
                                                                                                                                                                                            Phaseolus aureus (Mung bean) (Vigna radiata).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids I;
Fabales; Fabaceae; Papilionoideae; Vigna.
                                                                                                                                                                                                                                                                                                                                                                   CYTOCHROME CIPCYP.
                                                           PROSITE; PS00086; CYTOCHROME_P450; UNKNOWN_1.
Electron transport; Endoplasmic reticulum; Heme;
Monooxygenase; Oxidoreductase.
SEQUENCE 474 AA; 54037 MW; A2542A809C5BAC6D;
                                                                                                                                                                                 - ! - SUBCELLULAR LOCATION: MEMBRANE-BOUND. ENDOPLASMIC
                                                                                                                                                                                                                                                                                                      NCBI_TaxID=3916;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LKFNWELAEDDQPFAFPFVDFPNGLPIRVSRIL 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KKETFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKWSMLVLVGDMHRDMKSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LKFNWELAEDDKPFAFPFVDFPNGLPIRVSRIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ILDLILSLLFAGHETSSVAIALATFFLQACPKAVEELREEHLEIARAKKELGESELNWDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQ
            Similarity
                                                                                                                                                                                                                                                                                                                                                                                        (TrEMBLrel. 15, (TrEMBLrel. 15, (TrEMBLrel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                            sequencing of a Vigna radiata cDNA encoding
           35.5%;
 97;
                                                                                                                                                                                                                                                                                                                                                                                        Created)
Last sequence up
Score 951; DB 10;
Pred. No. 8.2e-60;
7; Mismatches 162;
                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                           CYTOCHROME P450 FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    513
                                                                                                                                                                                                                                                                                                                                                                                                                                        ₿
                                                                                                                                                                                                                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                       databases.
rein + O(2)
                                                            CRC64;
                      Length
                                                                                    Membrane;
                                                                                                                                                                                  RETICULUM
                         474;
                                                                                                                                                                                                          .
                                                                                                                                                                                                                                            cytochrome
                                                                                                                                                                                  (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         48C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
```

```
멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
           Ş
                                                     δ
                                                                               밁
                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                   밁
                                                                                                                           Query Ma
Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                               01-MAR-2001
01-MAR-2001
01-MAR-2001
                                                                                                                                                                                                                                                                                                                                                         STEROID 2
T9L24.44.
                                                                                                                                                                                 STRAIN-CV. COLUMBIA;
Lin X., Kaul S., Town C.D., Benito M., Creasy T.H., Haas B.J.,
Maiti R., Ronning C.M., Koo H., Fujii C.Y., Utterback T.R.,
Barnstead M.E., Bowman C.L., White O., Nierman W.C., Fraser C.
"Arabidopsis thaliana chromosome 1 BAC T9124 genomic sequence."
"Arabidopsis thaliana chromosome 1 BAC T9124 genomic sequence."
"Bubli (NOV-2000) to the EMBL/GenBank/DDBJ databases."
EMBL; AC012396; AAG30983.1; -.
                                                                                                                                                                                                                                                                                                           Magnoliophyta; eudicotylede
Brassicales; Brassicaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                             Q9FX29
                                                                                                                                                                                                                                                                                                                                   Eukaryota; Viridiplantae;
                                                                                                                                                                                                                                                                                                                                             Arabidopsis thaliana (Mouse-ear cress)
                                                                                                                                                                                                                                                                                                                                                                                                                  Q9FX29;
                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                  NCBI_TaxID=3702;
             102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59
                                   71
                                                         67
                                                                               11
                                                                                                      12
                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 67
                                                                                                                                                   Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RQR---
NPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLYLKFNW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSML
                                                                              LLSVSSSTTFLAFIIIFLLAGIARRKRRAPHRLPPGSRGWPLIGDTFAWLNAVAGSHPSS
                                                                                                     LLLLPSLLSLLLFLIL-----LKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VPAEEDKLVFFPTTRTQKRYPIIVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ELAEDDQPFAFPFVDFPNGLPIRVSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LMKGALHKRMHSLTMSFANSSIIKDHLLHHIDRLIGLNLDTWSDR--VTLMDQAKKITFE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FMDERVRRYGSIFMTHVFGEPTVFSADPELNRFILQNEGKLLDCSYPGSISNLLGKHSLL
                                  FVEKQIKKFVSLLCSVLLLILKRPDNSGFNEIRYGRIFSCSLFGKWAVVSADPDFNRFIM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NPWRWQSNSSEAANP-----ANVYTPFGGGPRLCPGYELARVVLSVFLHRIVTRFSW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FTQHVVNETLRVANIIGGIFRRATTDIDIKGYTIPKGWKVFASFRAVHLNPEYYKDARTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMD
                                                                                                                                                                                                                                                                                                                                                                     2001 (TrEMBLrel. 16, C:
2001 (TrEMBLrel. 16, L:
2001 (TrEMBLrel. 16, L:
22-ALPHA-HYDROXYLASE,
                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     idiplantae; Embryophyta; Tracheceudicotyledons; core eudicots; rassicaceae; Arabidopsis.
                                                                                                                                      32.3%;
                                                                                                                           105;
                                                                                                                       Score 866; DB
Pred. No. 1e-5;
05; Mismatches
                                                                                                                                                                                                                                                                                                                                                                              Last sequence u
                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                      PUTATIVE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          511
                                                                                                                                                                                                                                                                                                                                                                                                                             512
                                                       -YGKIYRSNLFGEPTIVSADAGLNRFIL
                                                                                                                                      1e-53;
                                                                                                                                                                                                                                                                                                                                   Tracheophyta;
                                                                                                                                                   DB
                                                                                                                                                                                                                                                                                                                                                                                                                             ₿
                                                                                                                                                                                                                                                                                                                                                                                           update)
                                                                                                                           173;
                                                                                                                                                10;
                                                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                                         Rosidae;
                                                                                                                                                Length
                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                       Spermatophyta; e; eurosids II;
                                                                                                                                                   51
                                                                                                                                                                                                                                                     В.J.,
                                                                                                                           76;
                                                                                                                                                                                                                                                       ٤
                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              126
                                                       101
                                                                                                                                                                                                                                                       D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  186
                                                                                                     66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      246
                                                                              70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     272
                                                                                                                           7;
```

```
22427
22427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
232427
23247
23247
23247
23247
23247
23247
23247
23247
23247
23247
23247
23247
23247
23247
23247
23247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 023242;
1 01-JAN-1998 (TrEMBLrel. 05, Created)
1 01-JAN-1999 (TrEMBLrel. 11, Last sequence update)
1 01-MAR-2001 (TrEMBLrel. 16, Last annotation update)
2 CYTOCHROME P450 (CYTOCHROME P450 LIKE PROTEIN).
2 ROTUNDIFOLIA3 OR C7A10.980.
3 RATABIOLOSIS thaliana (Mouse-ear cress).
3 Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
3 C Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
3 C Brassicales; Brassicaceae; Arabidopsis.
SIMILARITY).

SIMILARITY: BELONGS TO THE CYTOCHROME P450 I
EMBL; AB008097; BAA37167.1; -.
EMBL; 299708; CAB16850.1; -.
EMBL; AL022141; CAB18139.1; -.
Interpro; IPR001005; -.
Interpro; IPR001128; -.
Pfam; PF00067; P450; 1.
PRINTS; PR00385; P450.
PROSITE; PS00086; CYTOCHROME P450; UNKNOWN_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "The RO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                023242
                                                                                                                                                                                                                                                                         Submitted (MAR-1998) to the EMBL/GenBank/DDBJ databases.
-!- CATALYTIC ACTIVITY: RH + REDUCED FLAVOPROTEIN + O(2)
OXIDIZED FLAVOPROTEIN + H(2)O (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 270-524 FROM N.A. Bevan M., Hilbert H., Braun M. Hoheisel J., Jesse T., Heijne Schueller C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bevan M., Terryn N., Chalwatzis N.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Kim G., Tsukaya H., Uchimiya H.;
"The ROTUNDIFOLIA3 gene of Arabidopsis
of the cytochrome P-450 family that is
polar elongation of leaf cells.";
                                                                                                                                                                                                                                                     -!- SUBCELLULAR LOCATION: MEMBRANE-BOUND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 68-524 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Genes Dev.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A. MEDLINE=98361880; PubMed=9694802;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GWKVLPVISAVHLDNSRYDQPNLFNPWRW-----QQQNNGASSSGSGSFSTWGNNYMPFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQR:||| |:||:::| |: : : | : |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QNEGKLFQSSYPKSFRDLVGKDGVITVHGDQQRRLHSIASSMMRHDQLKTHFLEVIPVVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGTRFCPGAELARLQIALFLHYFITTYKWTQLKEDRISFFPSARLVNGFKIQLNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRVSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCFVVPFLSAVHLDESYYKESLSFNPWRWLDPETQQKRNWRTSP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGNGVLGRLLEEESLENESMADFIINLLFAGNETTSKTMLFAVYFLTHCPKAMTQLLEEH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DLPGFTYNKAMKARKEIIRKINKTIEKRLQNKAASD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LQTLSNFKDGEVVLLQDICRKVAIHLMVNQLLGVS-SESEVDEMSQLFSDFVDGCLSVPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (OCT-1997) to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12:2381-2391(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -DRLAGGMLTWQDYKTMDFTQCVIDETLRLGGIAIWLMREAKEDVSYQDYVIPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Vos
                                                                                                                                                                                                                                                                                                                                                                            Braun M.,
, Heijnen I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Heijnen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                         ۳.
                                                                                                                                                                                                                                                                                                                                                                            Holzer
L., Vos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ۲.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 thaliana required
                                                                                                                                                                                                                                                                                                                                                                            ъ.
; ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mewes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                       P450
                                                                                                                                                                                                                                                       ENDOPLASMIC
                                                                                                                                                                                                                                                                                                                                                                            Brandt .
Mewes H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ophyta; Spermatophyta;
Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            H.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 encodes
for the
                                                                                                                                                                                                                                                                                                                                                                              H
                                                                                                                                                                                                                                                                                                                                                                            A., I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Schueller
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----T
                                                                                                                                                                                                                                                       RETICULUM
                                                                                                                                                                                                                                                                                                                                                                                                     Duesterhoeft
                                                                                                                                                                                                                                                                                                                                                                            Mayer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a new mem regulated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---FYCPFG
                                                                                                                                                                                                                                                                                                        ı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       member
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                       (B)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         190
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Ma
Best Loc
Matches
EU Arabidopsis sequencing project;
Submitted (MAR-2000) to the EMBL/GenBank/DDBJ databases.
Submitted (TAR-2000) to the EMBL/GenBank/DDBJ databases.
-I- CATALYTIC ACTIVITY: RH + REDUCED FLAVOPROTEIN + O(2) =
OXIDIZED FLAVOPROTEIN + H(2)O (BY SIMILARITY).
-I- SUBCELLULAR LOCATION: MEMBRANE-BOUND. ENDOPLASMIC RETIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROSITE; F
Electron t
Membrane;
SEQUENCE
                                                                                                                                                                                                                                                           01-0CT 2000 (TremBLrel. 15, C
01-0CT-2000 (TremBLrel. 15, L
01-MAR-2001 (TremBLrel. 16, L
CYTOCHROME P450 LIKE PROTEIN.
                                                                                                                    Hilbert H.,
Mewes H.W.,
                                                                                                                                                                                      Arabidopsis thaliana (Mouse-ear cress),
Eukaryota; Viridiplantae; Embryophyta; Trachec
Magnoliophyta; endicotyledons; core endicots;
Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                     Q9M066;
                                                                                                        Submitted (MAR-2000)
                                                                                                                                                                                                                                                 AT4G36380
                                                                                                                                                                                                                                                                                                                                    Q9M066
                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24
                                                                                                                                                                                                                                                                                                                                                              σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KLELGE-EYKWIDYMSLSFIQNVINETLRMANIINGVWRKALKDVEIKGYLIPKGWCVLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---KPYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FLIL------
                                                                                                                                                                                                                                                                                                                                                                                                       SKLEISIFLHHLVTRYSW-TAEEDEIVSFPTVKMKRRLPIRVATV
                                                                                                                                                                                                                                                                                                                                                                                                                                AKLEMAVEIHHLYLKENWELAEDDQPFAFPFVDFPNGLPIRVSRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VHVQDEIKKMTFEILVKVLMSTSPG-EDMNILKLEFEEFIKGLICIPIKFPGTRLYKSLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FLVLTAGILLRPWLWFRLRNSKTKDGDEEEDNEEKKKGMIPNGSLGWPVIGETLNFIACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AKERLIKMVKKVVEERQVAMTTTSPANDVVDVLLRDGGDSEKQSQPSDFVSGK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SRATILKFIERKMEERKLDIKEEDQEEEEVKT----EDEAEMSKSDHVRKQRTDDDLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KSITELLGENSILSINGPHQKRLHTLIGAFLRSPHLKDRITRDIEASVVLTLASWAQLPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSI
                                                                                            SEQUENCE FROM N.A.
H., Braun M., Holzer E., Brandt A.,
H., Lemcke K., Mayer K.F.X.;
ed (MAR-2000) to the EMBL/GenBank/DD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PS00037; MYB_1; UNKNOWN_1.

transport; Endoplasmic reticulum; Heme; Hypothetical
; Microsome; Monooxygenase; Oxidoreductase,
524 AA; 59389 MW; 550578908BDDF272 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FMDKRKSLYGKVFKTNIIGTPIIISTDAEVNKVVLQNHGNTFVPAYP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         32.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -IVEMMIPGEETMPTAMTLAVKFLSDNPVALAKLVEENMEMKRR
                                                                                                                                                                                                                                                                          Last sequence up
                                                                                                        EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      550578908BDDF272 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches 165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              864; DB 10;
No. 1.5e-53;
                                                                                                                                                                                                                                                                                                                                  457
                                                                                                                                                                                                     Tracheophyta; S;
dicots; Rosidae;
                                                                                                                                                                                                                                                                          on update)
                                                                                                                                                                                                                                                                                                                                  A
                                                                                                                                   Duesterhoeft
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----FTPFGGGQRLCPGLEL
                                                                                                        databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                       512
                                                                                                                                                                                                                                                                                                                                                                                                                                  512
                                                                                                                                                                                                      Spermatophyta;
e; eurosids II;
       RETICULUM
                                   ROH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein;
       (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10;
```

```
RESULT
Q9LN73
    δÃ
                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SO W NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Ma
Best Loc
Matches
                                                                                                                      01-OCT-2000 (TrEMBLre 01-OCT-2000 (TrEMBLre 01-MAR-2001 (TrEMBLre T12C24.27)
Arabidopsis thaliana
 SEQUENCE FROM N.A.

Chao Q., Brooks S., Buehler E., Johnson-Hopson C., Kh
Shinn P., Altafi H., Bei Q., Chin C., Chiou J., Choi
Conway A., Gonzales A., Hansen N., Howng B., Koo T.,
                                                                                                                                                                                         Q9LN73;
                                                                                 Eukaryota; Viridiplantae; Embryophyta; Trache Magnoliophyta; eudicotyledons; core eudicots; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro; IPR001105; -.
InterPro; IPR001128; -.
Pfam; PF00067; P450; 1.
PRINTS; PR00385; P450.
PROSITE; PS00086; CYTOCHROME_P450;
PROSITE; PS00037; MYB_1; UNKNOWN_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Electron transport; Endoplasmic Monooxygenase; Oxidoreductase. SEQUENCE 457 AA; 51607 MW; F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SIMILARITY).
-!- SIMILARITY: BELONGS TO
EMBL; AL161589; CAB80304.1;
                                                                                                                                                                                                                                                                          440
                                                                                                                                                                                                                                                                                                                                                       447
                                                                                                                                                                                                                                                                                                                                                                                                           387
                                                                                                                                                                                                                                                                                                                                                                                                                                      271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Si
hes 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IPNGSLGWPVIGETLNFIACGYSSRPVT-----FMDKRKSLYGKVFKTNIIGTPIIIST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LPPGKSGWPELGETIGYL-----KPYTATTLGDFMQQHVSKYGKIYRSNLEGEPTIVSA
                                                                                                                                                                                                                                                                          IRVATV
                                                                                                                                                                                                                                                                                                  IRVSRI
                                                                                                                                                                                                                                                                                                                                                      {\tt TWGNNYMPFGGGPRLCAGSELAKLEMAVFIHLVLKFNWELAEDDQPFAFPFVDFPNGLP}
                                                                                                                                                                                                                                                                                                                                                                                KALKDVEIKGYLIPKGWCVLASFISVHMDEDIYDNPYQFDPWRWDRINGSANSSIC----
                                                                                                                                                                                                                                                                                                                                                                                              KALKDYRYKGYDIPSGWKYLPYISAYHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                    LQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IKGLICIPIKFPGTRLYKSLKAKERLIKMVKKVVEERQVAMTTTSPANDVVDVLLRDGGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKT-----E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ITRDIEASVVLTLASWAQLPLVHVQDEIKKMTFEILVKVLMSTSPG-EDMNILKLEFEEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DAEVNKVVLQNHGNTFVPAYPKSITELLGENSILSINGPHQKRLHTLIGAFLRSPHLKDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTI 152
                                                                                                                                                                                                                                                                                                                                                                                                                                      LSDNPVALAKLVEENMEMKRRKLELGE-EYKWTDYMSLSFTQNVINETLRMANIINGVWR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                              -FTPFGGGQRLCPGLELSKLEISIFLHHLVTRYSW-TAEEDEIVSFPTVKMKRRLP
                                                                                                                                                   (TrEMBLrel. 15, (TrEMBLrel. 15, (TrEMBLrel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                         (Mouse-ear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          32.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TO THE
                                                                                                                                                   Created)
Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BD6AA148E44EACD2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CYTOCHROME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ore 860; DB 10;
ed. No. 2.4e-53;
Mismatches 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         reticulum; Heme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   UNKNOWN_1.
                                                                                              Tracheophyta; S
dicots; Rosidae;
                                                                                                                                                                                                       ₿
                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    P450 FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IVEMMIPGEETMPTAMTLAVKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              160;
                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
               Khan S.,
                                                                                              Spermatophyta;
e; eurosids II;
    Lam
Conn
a B., J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              54;
                            Kim C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
    C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  174
                                                                                                                                                                                                                                                                                                                                                                                385
                                                                                                                                                                                                                                                                                                                                                                                                           446
                                                                                                                                                                                                                                                                                                                                                                                                                                      329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       266
```

```
Query Match
Best Local S
Matches 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Cheuk R., Shinn P., Brooks S., Buehler E., Chao Q., Johnson-Hopso Khan S., Kim C., Altafi H., Bei B., Chin C., Chiou J., Choi E., Conn L., Conway A., Gonzalez A., Hansen N., Howing B., Koo T., Lau Lee J., Lenz C., Li J., Liu A., Liu J., Liu S., Mukharsky N., Nguyen M., Palm C., Pham P., Sakano H., Schwartz J., Southwick A. Thaveri A., Toriumi M., Vaysberg M., Yu G., Davis R., Federspiel Theologis A., Ecker J.; Submitted (JUL-2000) to the EMBL/GenBank/DDBJ databases.
-!- SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
EMBL, AC025417; AAF88087.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Lenz C., Li J., Liu A., Liu Palm C., Pham P., Sakano H., Toriumi M., Vaysberg M., Yu Cecker J.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Genomic I.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro; IPR001128; -.
Pfam; PF00067; P450; 1.
PRINTS; PR00385; P450.
PROSITE; PS00086; CYTOCHROME_P450; UNKNOWN_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ecker
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Submitted (JUL-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (MAR-2000)
                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     124
    483
                                                 397
                                                                                         423
                                                                                                                                     337
                                                                                                                                                                               369
                                                                                                                                                                                                                          278
                                                                                                                                                                                                                                                                      309
                                                                                                                                                                                                                                                                                                                                                             252
                                                                                                                                                                                                                                                                                                                                                                                                            183
                                                                                                                                                                                                                                                                                                                                                                                                                                                      192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4
                                                                                                                                                                                                                                                                                                              FNWELAEDDQPFAFPFVDFPNGLPIRVSR
                                                                                                                                 QFINETARLANIVPAIFRKALRDIKFKEFVNDTDYTIPAGWAVMYCPPAVHLNPEMYKDP
                                                                                                                                                          CVINETLRLGNVVRFLHRKALKDVRYK-----GYDIPSGWKVLPVISAVHLDNSRYDQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                      IMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MYKYLKNMVLTLFGHDGLKK-MLPQVEMTANKRLELWSNQDSVELKDATASMIFDLTAKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VKKYGPIFKTNLVGRPVIVSTDADLSYFVFNQEGRCFQSWYPDTFTHIFGKKNVGSLHGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LLIWVSLLLISITHWVYSWRNPKCRGKLPPGSMGFPLLGESIQFFKPNKTSDIPPFIKER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH 71
                                              LVFNPSRWE------GSKVTNASKHFMAFGGGMRFCVGTDFTKLQMAAFLHSLVTK
                                                                                      NLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFTHHLVLK
                                                                                                                                                                                                                          LFASFETTSLALTLAIKFLSDDPEVLKRLTEEHETILR-NREDADSGLTWEEYKSMTYTF
                                                                                                                                                                                                                                                                    LFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Monooxygenase; Oxidoreductase
NCE 478 AA; 55057 MW; F67A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity 35.0
81; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (MAR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                   -DKSSENLRANFVAFIQGLISFPFDIPGTAYHKCLQGRAKAMKMLRNMLQERR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 30.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ಕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Liu K.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 822; DB Pred. No. 1.3e Pred. No. 1.3e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Schwartz J., Southwick A., Thaveri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          F67A9B9F2FD28558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Federspiel N.A.,
    511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 10;
.3e-50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            187;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              T12C24 from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Theologis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Johnson-Hopson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Α.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lam
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Α.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                             308
                                              446
                                                                                                                                   396
                                                                                                                                                                             422
                                                                                                                                                                                                                          336
                                                                                                                                                                                                                                                                    368
                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                      251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   182
                                                                                                                                                                                                                                                                                                                277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    в.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                c.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT OCCUPANT OCCUP
                                                                                  Qy
                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
δõ
                                            밁
                                                                                                                                 В
                                                                                                                                                                    Qy
                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rudd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     447
  465
                                                                                         405
                                                                                                                                 231
                                                                                                                                                                             345
                                                                                                                                                                                                                          225
                                                                                                                                                                                                                                                                    285
                                                                                                                                                                                                                                                                                                                   182
                                                                                                                                                                                                                                                                                                                                                             225
                                                                                                                                                                                                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                                                                                                                                                                                                                                      165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N
```

Š

밁

Qy 멍 Qy 망 Š 밁 Q 밁 Ş

Ş

Š В QΥ B

밁

```
01-OCT-2000 (TremBLrel. 1: 01-MAR-2001 (TremBLrel. 1: 1: 47-7001 (TremBLrel. 1: 47-7001) (TremBLrel. 1: 48-7001) (TremBLrel. 1: 48-7001) (TremBLrel. 1: 48-7001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Membrane;
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Sp
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
Brassicales; Brassicaceae; Arabidopsis.
NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EU Arabidopsis sequencing project;
Submitted (APR-2000) to the EMBL/GenBank/DDBJ databases.
-!- CATALYTIC ACTIVITY: RH + REDUCED FLAVOPROTEIN + O(2)
OXIDIZED FLAVOPROTEIN + H(2)O (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9LY89;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         681160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Electron transport;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIMILARITY).
EMBL; AL163817; CAB87779.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bevan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pfam; PF00067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro;
                                                                                              289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    45 GWPFLGETIGYLKPYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNE 104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SUBCELLULAR LOCATION: MEMBRANE-BOUND. ENDOPLASMIC RETICULUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YRWEEIKGGNITRTPGLQFPNGYHVKLHK
SELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRV
                                                                                                  159;
                                                                                                                                                                                                                                                          ARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GKLFTSDYPKAMHDILGKYSLLLATGEIHRKLKNVIISFINLTKSKPDFLHCAENLSISI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFV 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GWPFIGETISFFKPHRSDSIGTFLOORVSRYGKVFKSNICGGKAVVSCDQELNMFILONE
                                                                                                                                                                                                                           -RAKKGDGEL-LNWEDYQKMEFTQCVISEALRCGNIVKTVHRKATHDIKFNEYVIPKGWK
                                                                                                                                                                                                                                                                                                                                                                                                                      DLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTGYTNAIKVRSNRNIHQNAIIEDMNNAIREEDFLDSIISNED--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LKSWKNCREVEFHKEVKIFTLSVMVNQLLSIKPEDPARLYVLQDFLSYMKGFISLPIPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ξ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ., Murphy G.,
, Lemcke K., M
ed (APR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IPRO01128; -.
10067; p450; 1.

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KDA PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             , Ridley
Mayer K.
)) to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   30.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15,
16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                P., Hudson S., ван
.F.X.;
EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last sequence u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 815; DB 10;
Pred. No. 2.9e-50;
7; Mismatches 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1BC5685AB73B4E30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hypothetical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bancroft I.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        127;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mewes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ξ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Σ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (BY
                                                                                                                                                                                                                                                                                            404
                                                                                                                                                                                                                                                                                                                                                                                                                      344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                     329
                                                                                                                                                                  464
                                                                                                                                                                                                                               288
                                                                                                                                                                                                                                                                                                                                                            230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
```

```
밁
                        Š
                                                       밁
                                                                                 Ş
                                                                                                               밁
                                                                                                                                         Ω
                                                                                                                                                                         밁
                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                               . 망
                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₽
                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Arabidopsis thaliana (Mouse-ear cress).

Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
Brassicales; Brassicaceae; Arabidopsis.

NCBI_TaxID-3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA Res. 7:217-221(2000).
-I- SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY EMBL; AP001307; BAB01922.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence features of TAC and BAC clones."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation update)
CYTOCHROME P450-LIKE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9LIC5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROSITE; PS00086; CYTOCHROME_P450; UNKNOWN_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       InterPro; IPR000504; ...
InterPro; IPR001128; ...
Pfam; PF00067; p450; 1.
PRINTS; PR00385; P450.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (MAR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A. STRAIN-COLUMBIA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Structural analysis of Arabidopsis thaliana chromosome 3. II.
Sequence features of the regions of 4,251,695 bp covered by ninety P1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PubMed=10907853;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=COLUMBIA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Kaneko T., Kato T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9LIC5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nakamura
389
                            397
                                                                                      337
                                                                                                                  289
                                                                                                                                              277
                                                                                                                                                                          231
                                                                                                                                                                                                       220
                                                                                                                                                                                                                                    172
                                                                                                                                                                                                                                                                                            112
                                                                                                                                                                                                                                                                                                                       100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    330
                                                                                                                                                                                                                                                                                                                                                   52
                                                                                                                                                                                                                                                                                                                                                                             40
                                                                                                                                                                                                                                                                                                                                                                                                                          ocal Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9
                                                                       LREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKG
                                                                                                                                                                                         PLNLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEM---SKSDH
                                                                                                                                                                                                                                 FLSESMDLWSEDQPYLLQDVSKTVAFKVLAKALISVEKG-EDLEELKREFENFISGLMSL
                                                                                                                                                                                                                                                                                                                                                                 PPGKSGWPFLGETIGYLKPYTATTLGDFWQQHVSKYGKIYRSNLFGEPTIVSADAGLNRF
YVIPKGWCFLAYLRSVHLDKLYYESPYKFNPWRWQERDMNTSS
                         YDIPSGWKYLPYISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFG
                                                                                                               VRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEE
                                                                                                                                                                                                                                                                                          VLQSDSTAFVPFYPKTVRELMGKSSILLINGSLHRRFHGLVGSFLKSPLLKAQIVRDMHK
                                                                                                                                                                                                                                                                                                                    ILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVER 159
                                                      LTEENMKL-KSLKELTGEPLYWNDYLSLPFTQKVITETLRMGNVIIGVMRKAMKDVEIKG
                                                                                                                                                                         PINFPGTQLHRSLQAKKNMVKQVERIIEGKIR--KTKNKEEDDVIAKDVVDVLLKDSSEH
                                                                                                                                                                                                                                                             HTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSA
                                                                                                                                                                                                                                                                                                                                                  PHGSLGWPVIGETIEFVSSAYSDRPESFMDKRRLMYGRVFKSHIFGTATIVSTDAEVNRA 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GELGKLQIAFFLHHLVLSYRWKIKSDEMPIAHPYVEFKRGMLLEI 374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Monooxygenase;
NCE 464 AA;
                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 52864 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sato
                                                                                                                                                                                                                                                                                                                                                                                                                         29.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Oxidoreductase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         o S., Nakamura Y., Asamizu E., To the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                          101;
                                                                                                                                                                                                                                                                                                                                                                                                                       Score 789; DB 10;
Pred. No. 2.7e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A65E094665E5190B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches 145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 464;
                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Tabata
                                                                                                                                                                                                                                                                                                                                                                                                          38;
-FSPFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        :
:
                                                                                                                                                                                                                                                             219
436
                           456
                                                                                   396
                                                                                                                                                                                                     276
                                                                                                                                                                                                                                 230
                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
Q9FMA5
            망
                                     δÃ
                                                                     밁
                                                                                                                             밁
                                                                                                                                                        Ş
                                                                                                                                                                                        덩
                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                         Ω
                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                204
                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9FMA5; PREL:
Q9FMA5;
01-MAR-2001 (TrEI
01-MAR-2001 (TrEI
01-MAR-2001 (TrEI
CYTOCHROME P450.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-COLUMBIA;
MEDLINE-98290546; PubMed-9628582;
Sato S., Kaneko T., Kotani H., Nakamura Y., Asamizu E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Structural analysis of Arabidopsis thaliana chromosome Sequence features of the regions of 1,456,315 bp covered physically assigned Pl and TAC clones.";
DNA Res. 5:41-54(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Arabidopsis thaliana (Mouse-ear cress). Reukaryota; Viridiplantae; Embryophyta; Trachec Magnoliophyta; eudicotyledons; core eudicots; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Tabata S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=3702;
            430
                                        477
                                                                                               417
                                                                                                                             321
                                                                                                                                                                                                                                                230
                                                                     381
                                                                                                                                                          357
                                                                                                                                                                                        263
                                                                                                                                                                                                                  297
                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   457
                                                                                                                                                                                                                                                                                                                                   186
                                                                                                                                                                                                                                                                                                                                                                                           130
                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                   70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12 LLLLPSLLSLLFLILLKRRN--RKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFWQ 69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10
                                                                                            SRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFI 476
                                                                                                                                                                                  TDEETRDQVVTTLYSGYETVSTTSMMALKYLHDHPKALQELRAEHLAFRERKRQ--DEPL
                                                                                                                                                                                                  STEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESEL
                                                                                                                           GLEDVKSMKFTRAVIYETSRLATIVNGVLRKTTRDLEINGYLIPKGWRIYVYTREINYDA
                                                                                                                                              NWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDN 416
                                                                                                                                                                                                                                                                         FIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSN----L
                                                                                                                                                                                                                                                                                                                                                                                                                      NQRLRYGSFFKSHLLGCPTLISMDSEVNRYILKNESKGLVPGYPQSMLDILGTCNMAAVH 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGPRLCAGSELAKLEMAVFIHHLVLKF
|| || || + :|| :|| :|| :|| :||
GGQRLCPGLDLARLETSVFLHHLVTRF
            HYFVTRYRWEEIGGDELMVFPRVFAPKGFHLRIS
                                        HHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRVS 510
                                                                   NLYEDPLIFNPWRWMKKSLESQ------NSCFVFGGGTRLCPGKELGIVEISSFL
                                                                                                                                                                                                                                              LLRELMQERR------DSGE-----TFTDMLGYLMKKEGNRYPL
                                                                                                                                                                                                                                                                                                      TQIAGNLRKPFV-----
                                                                                                                                                                                                                                                                                                                          ----NLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILK
                                                                                                                                                                                                                                                                                                                                                              GSSHRLMRGSLLSLISSTMMRDHILPKVDHFMRSYLDQWNELEVIDIQDKTKHMAFLSSL
                                                                                                                                                                                                                                                                                                                                                                                        GDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                 QHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLV 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LLIIVSLCSALL-----RWNQMRYTKNGLPPGTMGWPIFGETTEFLKQGP----NFMR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AB009048;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              465 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (TrEMBLrel. 16, (TrEMBLrel. 16, (TremBLrel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BAB08653.1; -.
AA; 53767 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27.1%; 32.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    91;
                                                                                                                                                                                                                                                                                                      · EEFKTAFFKLVVGTLSVPIDLPGTNYRCGIQARNNIDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 726; DB 10;
Pred. No. 8.4e-44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0C00459C9C866D1F CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tracheophyta; Spermatophyta;
dicots; Rosidae; eurosids II;
            463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bp covered
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  465;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             мiyajima
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ٧
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      76;
```

Gaps

10;

59

z

240

185

380

356 262 296 229

```
RESULT
O91H81
O91H81
O71H81
O7
                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                         δ
Ā
                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
  맑
                                            Q
                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 163; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAC and BAC clones.";

DNA Res. 7;217-221(2000).

1- SIMILARITY: BELONGS TO THE CYTOCHROME P450 I
EMBL; AP002060; BAB02270.1; -.

Interpro; IPR001128; -.

Pfam; PF00067; p450; 1.

PRINTS; PR00385; CYTOCHROME_P450; UNKNOWN_1.

PROSITE; PS00086; CYTOCHROME_P450; UNKNOWN_1.

Heme; MONDOXYGENASE; Oxidoreductase.

SEQUENCE 465 AA; 53862 MW; 630A21D0765E0D0D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=COLUMBIA;
Kaneko T., Kato T., Submitted (MAY-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Arabidopsis thaliana (Mouse-ear cress). Eukaryota; Viridiplantae; Embryophyta; Magnoliophyta; eudicotyledons; core eud Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-2000 (TremBLrel.
01-OCT-2000 (TremBLrel.
01-MAR-2001 (TremBLrel.
CYTOCHROME P450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Structural analysis of Arabidopsis thaliana chromosome Sequence features of the regions of 4,251,695 bp covered TAC and BAC clones.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-COLUMBIA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9LH81;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9LH81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nakamura Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PubMed=10907853;
  388
                                               424
                                                                                                 328
                                                                                                                                              364
                                                                                                                                                                                           270
                                                                                                                                                                                                                                        304
                                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                                    248
                                                                                                                                                                                                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                                                                                                188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ω
                             LFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF
                                                                                                                          MDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPN
                                                                                                                                                                                                                                                                                                                                                                                                                              MAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLV 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IMMMILGLLVIIVCLCTALLRWNQMRYSKKGLPPGTMGWPIFGETTEFLKQGP-----DF
                                                                                            MKFTRAVIFETSRLATIVNGVLRKTTHDLELNGYLIPKGWRIYVYTREINYDTSLYEDPM
                                                                                                                                                                                        QVVTILYSGYETVSTTSMMALKYLHDHPKALEELRREHLAIRERKRP--DEPLTLDDIKS
                                                                                                                                                                                                                                     LILSLLFAGHETSSVATALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKK
                                                                                                                                                                                                                                                                                                                               ERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSN----LSTEQILD
                                                                                                                                                                                                                                                                                                                                                                                 SSLLQIAETLKKPEVEEYRTEFFKLVVGTLSVPIDIPGTNYRSGFQARNNIDRLLTELMQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VHGPSHRLMRGSLLSLISPTMMKDHLLPKIDDFMRNYLCGWDDLETVDIQEKTKHMAF-L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MKNQRLRYGSFFKSHILGCPTIVSMDAELNRYILMNESKGLVAGYPQSMLDILGTCNIAA
  IFNPWRWMEKSLESKS - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sato
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              26.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             s.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15,
16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nakamura Y., Asamizu E., T
EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 711; DB 10;
Pred. No. 9.8e-43;
3; Mismatches 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            630A21D0765E0D0D
-YFLLFGGGVRLCPGKELGISEVSSFLHYFVTKY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              eudicots;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tracheophyta; Spermatophyta; dicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ą
                                                                                                                                                                                                                                                                                       -DMLGYLMKKEDNRYLLTDKEIRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P450 FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       195;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    covered
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 465;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Tabata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  II.
y ninety
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          67
  436
                                            483
                                                                                                                                                                                                                                     363
                                                                                                                                                                                                                                                                                                                                                                                                                              247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           57
                                                                                         387
                                                                                                                                           423
                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                 236
                                                                                                                                                                                        327
                                                                                                                                                                                                                                                                                    269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <u>P</u>1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
```

```
RESULT
Q9FH76
                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                    Qy
                                               В
                                                                     Qy
                                                                                                                   Qy
                                                                                                                                              밁
                                                                                                                                                                    Ş
                                                                                                                                                                                              밁
                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 163;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-MAR-2001 (TrEMBLrel.
01-MAR-2001 (TrEMBLrel.
01-MAR-2001 (TrEMBLrel.
CYTOCHROME P450.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q9FH76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Trachec
Magnoliophyta; eudicotyledons; core eudicots;
Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Clones.";
PMA Res. 7:31-63(2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN=COLUMBIA; MEDLINE=20181125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Tabata S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sato
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Structural analysis of features of the regions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          features
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 437
434
                        485
                                               387
                                                                       425
                                                                                               327
                                                                                                                      365
                                                                                                                                              269
                                                                                                                                                                       305
                                                                                                                                                                                               236
                                                                                                                                                                                                                      246
                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                      189
                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                      129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      484
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                      69
                                                                                                                                                                                                                                                                                                                                                                                                           14 LLPSLLSLLLELILLK-----RRNRKTRENLPPGKSGWPFLGETIGYLKPYTATTLGDFM 68
                                                                                                                                                                                                                                                                                                                                                                                              σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              s.
                                                                                                                                                           ILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKM
                                                                                                                                                                                                LSKRR
                                                                                                                                                                                                            LISIL---
                                                                                                                                                                                                                                                                                                                                                          QQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVL 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RWEENGEDKLMVFPRVSAPKGYHLKCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NWELAEDDOPFAFPFVDFPNGLPIRVS
WSIVGPSDGIQYGPFALP----QNGLPIALER
                       WELAEDDQ-----PFAFPFVDFPNGLPIRVSR 511
                                                                     FNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFN 484
                                                                                               PLTYRVIQETLRAATILSFTFREAVEDVEYEGYLIPKGWKVLPLFRNIHHNADIFSDPGK
                                                                                                                      DFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNL
                                                                                                                                              IIGVIFAARDTTASVLTWILKYLADNPTVLEAVTEEQMAIRKDKKE-GES-LTWEDTKKM
                                                                                                                                                                                                                                                                    AKHIMSMDPGEEET - - - EQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERK
                                                                                                                                                                                                                                                                                             QGDYHSKLRKLVLRAFMPDAIRN-MVPHIESIAQESLNSWDGTQLNTYQ-EMKTYTFNVA 179
                                                                                                                                                                                                                                                                                                                     VGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLM 188
                                                                                                                                                                                                                                                                                                                                              AAKQRRYGSVFKTHVLGCPCVMISSPEAAKFVLVTKSHLFKPTFPASKERMLGKQAIFFH 121
                                                                                                                                                                                                                                                                                                                                                                                              LFLTLSAAALFLCLLRFIAGVRRSSSTKLPLPPGTMGYPYVGET---FQLYSQDP-NVFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AB020744; BAB10255.1; -. VCE 463 AA; 52366 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Nakamura
                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                             -GKDEVYYREDLKRCYYILEKGYNSMPINLPGTLFHKAMKARKELAQILANI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ¥.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PubMed=10718197;
Y., Kaneko T., Katoh T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                         24.5%;
31.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16,
16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Arabidopsis thaliana chromosome of 3,076,755 bp covered by sixty
                                                VAPKPNTFMPFGSGIHSCPGNELAKLEISVLIHHLTTKYR
                                                                                                                                                                                                                                                                                                                                                                                                                                          95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
Pred.
                                                                                                                                                                                               QNPSSHT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCD17293F553F812 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches 184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      510
                                                                                                                                                                                                                                                                                                                                                                                                                                                         . No. 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   463
 461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Tracheophyta; S
dicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           .8e-39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Asamizu
                                                                                                                                                                                               -DLLGSFMEDKAGLTDEQIADN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         by sixty P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 463;
                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             [편
'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Kotani H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                              70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                      424
                                                                                                                                                                                                                                              235
                                                433
                                                                                               386
                                                                                                                                              326
                                                                                                                                                                       364
                                                                                                                                                                                              268
                                                                                                                                                                                                                      304
                                                                                                                                                                                                                                                                    245
                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                              15;
```

```
ALD DOCCOOC OF THE PROPERTY OF
ᇢ
                                         δÃ
                                                                                             밁
                                                                                                                                      QΨ
                                                                                                                                                                                          В
                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ,₽
                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          06-5624;
01-AUG-1998 (TrEMBLrel. 07, Created)
01-AUG-1998 (TrEMBLrel. 07, Last sequence update)
01-AUG-1998 (TrEMBLrel. 16, Last annotation update)
01-MAR-2001 (TrEMBLrel. 16, Last annotation update)
CYTOCHROME P450.
T18B16.200 OR AT4G19230.
Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Eukaryota; Uridiplantae; Embryophyta; Core eudicots; Rosidae; eurosids II;
Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Benes V.,
Mayer K.F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR001128; -.
Pfam; PF00067; P450; 1.
PRINTS; PR00385; P450; 1.
PROSITE; PS00086; CYTOCHROME_P450; UNKNOWN_1.
Heme; Monooxygenase; Oxidoreductase.
SEQUENCE 457 AA; 52436 MW; 6105FB7C181E4F07 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 131-457 FROM N.A.

Van Der Schueren J., Chuang Y.J., Aert R., Defoor E., Ro
Volckaert G., Mewes H.W., Lemcke K., Mayer K.F.X.,

Submitted (MAR-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.

Bevan M., Benes V., Rechmann S., I

Bevan M., Mayer K., Schueller C.

Submitted (JAN-1998) to the EMBL/C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        065624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Submitted (MAR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
273
                                                 309
                                                                                               240
                                                                                                                                                250
                                                                                                                                                                                               184
                                                                                                                                                                                                                                                193
                                                                                                                                                                                                                                                                                                 126
                                                                                                                                                                                                                                                                                                                                                  133
                                                                                                                                                                                                                                                                                                                                                                                                   66
                                                                                                                                                                                                                                                                                                                                                                                                                                                  73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13
                                                                                                                                                                                                                                                                                                                                                                                           LLLPSLLSLLLELILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHV 72
IFAARDTTASVMSWILKYLAENPNVLEAVTEEQMAI-RKDKEEGES-LTWGDTKKMPLTS
                                                 LFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQ
                                                                                                                              MSMDPGEEET----EQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEER
                                                                                                                                                                                                                                                                                                 HAKLRKLYLRAFMPESIRN-MVPDIESIAQDSLRSW-EGTMINTYQEMKTYTFNVALLSI
                                                                                                                                                                                                                                                                                                                                               HRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LFAGSLFLYFLRCLISQRRFGSSKLPLPPGTMGWPYVGET---FQLYSQDP-NVFFQSKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity 31.8
51; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ×
                                                                                                                                                                                               -GKDEVLYREDLKRCYYTLEKGYNSMPVNLPGTLFHKSMKARKELSQILARILSER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rechmann
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 s.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Borkova
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 632; DB 10;
Pred. No. 4e-37;
2; Mismatches 176;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Borkova
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ansorge W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        457
                                                                                             NDLLGSFMGDKEELTDEQIADNIIGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ansorge W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mewes H.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Robben
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bancroft
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lemcke
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ٦.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                 368
                                                                                                                                                                                                                                                                                                 183
                                                                                                                                                                                                                                                                                                                                                  192
330
                                                                                                  272
                                                                                                                                              308
                                                                                                                                                                                               239
                                                                                                                                                                                                                                                249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12;
```

```
RESULT
Q9F138
                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
  밁
                                           Qy
                                                                                                 뭐
                                                                                                                                       Qy
                                                                                                                                                                                                밁
                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OPFI38 PRELIMINARY; PKI; January, OPFI38; OPFI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kaneko T., Katoh T., Sato S., Nakamura Y., Asamızu E., A
Miyajima N., Tabata S.;
"Structural analysis of Arabidopsis thaliana chromosome
Sequence features of the regions of 1,011,550 bp covered
Pl and TAC clones.";
DNA Res. 6:183-195(1999),
EMBL; AB017064; BAB11064.1; -.
EMBL; AB017064; BAB11064.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=99397451; PubMed=10470850; Kaneko T., Katoh T., Sato S., Nakamura Y., Asamizu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-COLUMBIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=3702;
     450
                                                                                                 390
                                                                                                                                                                                                  331
                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                               256
                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14
                                                                                            RVIQETLRVASILSETEREAVEDVEYEGYLIPKGWKVLPLFRNIHHSADIFSNPGKEDPS
                                                                                                                                                                                                  TSSVTSLAIKFLAENHKALAELKREHAAILQNRNGKG
                                                                                                                                                                                                                                                 SSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYK-KMDFTQCVINET
                                                                                                                                                                                                                                                                                                    EEGEKEDVIFNEES------AINLIFAILVVAKES
                                                                                                                                                                                                                                                                                                                                             EDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHET
                                                                                                                                                                                                                                                                                                                                                                                                   VDNIMALGSEWFQSPLKLTTLISIYKVFIARRYALQVIKDVFTRRKASREMCGDFLDTMV
                                                                                                                                                                                                                                                                                                                                                                                                                                              KKEYVTFMKGVVSAPLNLPG-TAYHKALQSRATILKFIERKMEERK------LDIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EALKKKMIGEIDRVTYEHLRSKANQGSFDAKEAVESVIMAHLTPKIISNLKPETQAT--L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ARLRTILLKOVERHTLFVLDSWQQNSIFSAQDEAKKFTF-NLMAKHIMSMDPGEEETEQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NTVVLTEPDIIFEVFRQENKSFVFSYPEAFVKPFGKENVFLKHGNIHKHVKQISLQHLGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LYRWSNPKCNGKLPPGSMGLPIGETCDFFEPHGLYEISPEVKKRMLKYGPLFRTNIFGS 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LLKRRNRKTRENLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVSKYGKIYRSNLFGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RWQQQNNGASSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVF I HHLVLKFNWELAEDDQPF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 152;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----VAPKPNTFMPFGNGTHSCPGNELAKLEMSIMIHHLTTKY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23.5%;
-MVFGGGVRQCVGAEFARLQISIFIHHLVTTYDFSLAQESEFI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 631; DB 10;
Pred. No. 5.7e-37;
1; Mismatches 190
                                                                                                                                                                                                  -AGVSWEEYRHOMTFTNMVINET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      covered by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kotani H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ر
ن
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      seventeer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
     499
                                                   494
                                                                                                 449
                                                                                                                                               434
                                                                                                                                                                                                                                                 374
                                                                                                                                                                                                                                                                                                    330
                                                                                                                                                                                                                                                                                                                                               315
                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                   255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  428
                                                                                                                                                                                                  389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9,
```

B 64

500

RAPLPYFPKGLPIKISQSL 518

495 AFPFVDFPNGLPIRVSRIL

15;

```
Q9LG17;
Q9LG17;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-OCT-2000 (TrEMBLrel. 15,
01-OCT-2000 (TrEMBLrel. 15,
01-MAR-2001 (TrEMBLrel. 16,
F14716.21.
                                                                                                                                               Cheuk R., Shinn P., Brooks S., Buehler E., Chao Q., Johnson-Hopson C., Khan S., Kim C., Altafi H., Bei B., Chin C., Chiou J., Choi E., Conn L., Conway A., Gonzalez A., Hansen N., Howing B., Koo T., Lam B., Lee J., Lenz C., Li J., Liu A., Liu J., Liu S., Mukharsky N., Iguyen M., Palm C., Pham P., Sakano H., Schwartz J., Southwick A., Thaveri A., Toriumi M., Vaysberg M., Yu G., Davis R., Federspiel N., Theologis A., Ecker J., Theologis A., Ecker J., Submitted (JUN-2000) to the EMBL/GenBank/DBJ databases.

-I- CATALYTIC ACTIVITY: RH + REDUCED FLAVOPROTEIN + O(2) = ROH + OXIDIZED FLAVOPROTEIN + H(2)O (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Shinn P., Brooks S., Buehler E., Chao Q., Johnson-Hopson C., Khai Kim C., Altafi H., Bei Q., Chin C., Chiou J., Choi E., Conn L., Conway A., Gonzales A., Hansen N., Howing B., Koo T., Lam B., Let Lenz C., Li J., Liu A., Liu K., Liu S., Mukharsky N., Nguyen M., Palm C., Pham P., Sakano H., Schwartz J., Southwick A., Thaveri Proriumi M., Vaysberg M., Yu G., Federspiel N.A., Theologis A., Ecker J.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted (JUN-1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A. Shinn P., Brooks S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Brassicales; Brassicaceae; Arabidopsis
                                         InterPro; IPR001128; -. pfam; pF00067; p450; 2. prints; pF00086; p450; 2. pRINTS; pR00385; p450. proSITE; pS00086; CYTOCHROME_p450; UNKNOWN_1.
                                                                                                      -!- SIMILARITY: BELONGS TO THE EMBL; AC002304; AAF79335.1; -.
                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                    Submitted (MAY-2000) to the
                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (APR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted
                           Electron transport; Endoplasmic reticulum; Heme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Genomic sequence for Arabidopsis thaliana BAC F14J16 from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15
                                                                                                                                   SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (AUG-1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (JUN-1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
Oxidoreductase.
AA; 84661 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                  ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
                                                                                                                                                                                                                                                                                                                                                                                                                  the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                    EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL/GenBank/DDBJ
                                                                                                                       CYTOCHROME P450 FAMILY.
4718F6202974F811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                databases
CRC64;
                            Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Thaveri A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    chromosome
                            Microsome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Lee
```

Query Match
Best Local Similarity

23.5%;

Score Pred.

631; No. 9

l; DB 10; . 9.2e-37;

Length 735;

```
Qy
                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                    ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                         δÃ
                                                                                                                             В
                                                                                                                                                          20
                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                              484
                                                              645
                                                                                              424
                                                                                                                              585
                                                                                                                                                             393
                                                                                                                                                                                             528
                                                                                                                                                                                                                          336
                                                                                                                                                                                                                                                            484
                                                                                                                                                                                                                                                                                          276
                                                                                                                                                                                                                                                                                                                          428
                                                                                                                                                                                                                                                                                                                                                                                         370
                                                                                                                                                                                                                                                                                                                                                                                                                        178
                                                                                                                                                                                                                                                                                                                                                                                                                                                        310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19
                                                                                                                              EIKGKFRSLFCVIKITISLLPNDLIQNRVVVAGYTIPAGWIVLVVPSLLHYDPQIYEQPC
                                                                                                                                                                                                                                                                           DFVWLLNILDPLFY - - VKARSNVMKMLKRMFKERREEATSDDSKYGDFMETMIYEVEK - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LSLLLFLILLK------RRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH 71
DFSLIDKSYIIRAPLLRFSK--PIRIT 719
                              NWELAEDDQPFAFPFVDFPNGLPIRVS 510
                                                              EFNPWRWEGKE---LLSGSKTF-----MAFGGGARLCAGAEFARLQMAIFLHHLVTTY
                                                                                              LFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF
                                                                                                                                                                                           ELKREHETILQNRADKESG---VTWKEYRSMMNFTHMVINESLRLGSLSPAMFRKAVNDV
                                                                                                                                                                                                                        ELREEHLEIA - - RAKKELGESELNWDDYKK - MDFTQCVINETLRLGNVVRFLHRKALKDV
                                                                                                                                                                                                                                                                                                                                                      ~~~~-LNLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSD
                                                                                                                                                                                                                                                                                                                                                                                       DTSGRLILEQMILMIISNIKP--ETKSKLIESFRDFSFDLVRSPFDPSFWNALYNGLMLK
                                                                                                                                                                                                                                                                                                                                                                                                                        DEAKKFTFNLMAKHIMS-MDPGEEETEQLKKEYVTFMKGVVSAP--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                        IFGKDNLFFKQGKDFHRYMRHIALQLLGPECLKQRFIQQIDIATSEHLKSVSFQGVVDVK 369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ILGKWSMLVLVG-DMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQ 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MFKLVFIKSAGFKNLHGGSLFRTNILGSKTIVSTDPEVNFEILKQENRCFIMSYPEALVR 309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LSFVIALVVVKISLWLYRWANPNCSGKLPPGSMGFPVIGETVEFFKPYSFNEIHPFVKKR 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                            ----EGDTINEERSVELILSLLIASYETTSTMTALTVKFIAENPKVLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGG 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                           ---GYDIPSGWKVLPVISAVHLDNSRYDQPN 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     187;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                       427
                                                                                              483
                                                                                                                                                                                                                            392
                                                                                                                                                                                                                                                            527
                                                                                                                                                                                                                                                                                          335
                                                                                                                                                                                                                                                                                                                          483
                                                                                                                                                                                                                                                                                                                                                                                                                        220
                                                                                                                              644
```

Search completed: September 28, 2001, 18:45:40 Job time: 130 sec

.

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ñ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    on:
           Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     978.5
761.5
579.5
503
491.5
461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
        438
324.5
321.5
321.5
310.5
310.5
310.5
310.5
310.5
310.5
300
300
299.5
299.5
299.5
298.5
298.5
288.5
288.5
288.5
288.5
288.5
288.5
288.5
288.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     %
Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-502-426-2
2681
1 MFETEHHTLLPLLL
        236.5
118.6
118.6
118.7
118.7
118.6
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7
118.7

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 September 28, 2001, 18:43:55; Search time 13.15 Seconds (without alignments) 1336.355 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SwissProt_39:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  93435 seqs, 34255486 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MFETEHHTLLPLLLLPSLLS.....FAFPFVDFPNGLPIRVSRIL 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2000000000
        DВ
  C901_ ARATH
C983_ ARATH
C926_BRARE
C881_MAIZE
C926_MOUSE
C926_HUMAN
YRV2_CAEEL
YRVA_CAEEL
C912_ARATH
C932_RAT
CPJ5_MOUSE
CPJ6_MOUSE
CPJ6_MOUSE
CPJ6_MOUSE
CPJ6_RAT
CPJ5_RAT
CPJ5_CAEEL
C93_RATH
CPJ2_HUMAN
CPJ5_CAEEL
C895_MOUSE
CPS1_SOUME
CP51_CANGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ltd
     Q42569
Q43147
Q23147
Q231246
Q275127
Q27513
Q27514
Q27518
Q27519
Q27513
Q27517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3 caenorhabdi
0 mus musculu
4 mesocricetu
2 rattus norv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9 brachydanio
6 zea mays (m
7 mus musculu
4 homo sapien
4 caenorhabdi
9 caenorhabdi
0 arabidopsis
1 rattus norv
arabidopsis
homo sapien
candida gla
colanum mel
mus musculu
candida tro
                                                                                                                                                                                                                                                                                                        saccharomyc
l arabidopsis
rattus norv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9 arabidopsis
7 lycopersico
1 arabidopsis
                                                                                                                                                                     anabaena sp
caenorhabdi
                                                                                                                                                                                                                             homo sapien
drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                          mus musculu
oryctolagus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mus musculu
                                                                                                                                                                                                                                                                                 mus musculu
                                                                                                                                                                                                                                                                                                                                                                                                  rattus norv
```

Ç	Oy Db	Qý Db	X E O	DR DR SQ	388888888	C C C R R T T T R A R R R R R R R R R R R R R	DI II	RES C90		
_			Query Ma Best Loo Matches	EMI In: Pfa PR Ox. BII	This betw the use modi enti	SE S	15 15 15 CY Ara Bring NCI	ULT 1_AR C9		34 35 37 38 39 44 42 42 44 44 44 44
SO MEIDINGS	72 VSKYGKI  ::   64 VARYGSV	12 LLLLPSI         7 LLLLSSI	atch cal S 210	EMBL; X87367; CAA60793.1; EMBL; X87368; CAA60794.1; Interpro; IPRO01128; Pfam; PPRO067; p450; 2. PROSITE; PS00086; CYTOCHROME_P450; 1. Oxidoreductase; Monooxygenase; Heme. Oxidoreductase; Monooxygenase; Heme. BINDING 418 418 HEME (BY S BINDING 418 418 HEME (BY S	This SWISS-PR between the the European use by non- modified and entities requor send an en	SEQUENCE FROM N.A. STRAIN=CV. COLUMBIA; STRAIN=CV. COLUMBIA; MEDLINE=96200769; PubMed=8612270; MEDLINE=96200769; PubMed=8612270; MEDLINE=96200769; PubMed=8612270; MEDLINE=96200769; PubMed=8612270; MEDLINE=96200769; Mathur Szekeres M., Nemeth K., Koncz-Kalman Z., Mathur Szekeres M., Nemeth K., Koncz-Kalman T., Redei G.P., Nagy F., Schell J., Konc "Brassinosteroids rescue the deficiency of CYP96 controlling cell elongation and de-etiolation in Cell 85:171-182(1996).	15-DEC-1998 (Rel. 37, Cres 15-DEC-1998 (Rel. 37, Last 15-DEC-1998 (Rel. 37, Last 15-DEC-1998 (Rel. 37, Last CYTOCHROME P450 90A1 (EC : CYP90A1 OR CYP90 OR CPD. Arabidopsis thaliana (Mous Eukaryota; Viridiplantae; Magnoliophyta; eudicotylee Brassicales; Brassicaceae. NCBI_TaxID=3702;	1 ATH 01_ARATH 2569;		280.5 280 280 29.5 279.5 279.5 279.5 279.7 278.5 278.5 278.5 278.5
TOT NET C	GKIYRSNLFGI   :: ::    GSVFMTHLFGI	ILLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMOOH	imilarity ; Conserva	7; CAA60 3; CAA60 PR001128 57; p450 00086; C 118 418 418	SWISS-PROT entry is copyright. I een the Swiss Institute of Bioin European Bioinformatics Institute by non-profit institutions as fied and this statement is not retties requires a license agreement tend an email to licenseeisb-sib.c.	OM W.A. COLUMBIA COLUMBIA COLUMBIA COLOMBIA COLO	(Rel. 3: (Rel. 3: (Rel. 3: 450 90A. YP90 OR thalian /iridipla /a; eudi: Brassi:	STANI		10.4 10.4 110.4 110.4 110.4 110.4 110.4 110.4 110.4 110.4 110.4 110.4 110.4
שמ זמגט	STIGE      VILGE	ILLKRRNRKTRFNL             -LLLRRTRYRRMGL	36.5 41.9 ative	AA60793.1; 1AA60794.1; 1AA60794.1; 1AA60794.1; 1AA60794.1; 1AA60794.1; 1AA60794.1; 1AA60794.1; 1AA60793.1; 1AA60794.1; 1AA6079	ry is Instit ormati inst inst tateme licer licer	ubMed= K. K .P. N escue escue ongati 6).	7, Create 7, Last: 1 (EC 1 CPD. Mouse a (Mouse antae; Er cotyledor caceae;	DARD;		504 499 500 513 519 501 501 502 502 503 491 491
	SADA H SADP	NRK - TRY	## 7	OME_ enase	copyr tute o lcs In tituti ant is ane ag	*861 (onc (onc tagy the	eated it se it an 1.14 1.m Emb			
	GLNRI  - ETNRI	TRFN:	Sco. Pre	_P450 e; Hen HEME; 41;	of Bic Institutions a tions a is not agreeme isb-sil	2270 z-Ka r., def and	ted) sequence annotat: .14) e-ear cre Embryoph ons; core arabidop	PRT	Þ	CP3B_MOUSE C771_SOLME CP71_RABIT C773_SOYBN YKW8_CAEEL C4D2_DROME CF03_RABIT CP36_RABIT CP36_RABIT CP3B_MOUSE CP3D_MOUSE CPBS_RABIT CPB8_RABIT CPB8_RABIT
	FILO	LPPG       PPG	re 971 d. No Mismat	150; 1 Heme. EME (B 41A73	ght. It Bioinfo Bioinfo Litute. ns as lo not remo eement eement	; lman Sch icie ice-e de-e	nce u ation -). cress cress phyta ore e dopsi	τ,	Tak	MOU SOL SOL SOL SOL SOL SOL SOL SOL SOL SOL
7	SADAGLNREILONEGRLE	KSGWI    SLGLI	Score 978.5; Pred. No. 1.36; Mismatches	1. 3. 3. 3. 3. 3. 3. 4. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.	It is sinformatic. The This long removed ant (See ).ch).	2., ell ell tiol	update) on updat (s). (s). (a; Trac eudicot	472	AT.TGNMENTS	TERESTEE TERESTEE
	四二四	SWPFLGE	"i m	MILA: 64E3	s promatic There g as ed.	Mathur J., Kon of CYP9 ation i	te) date rach	*	л	
NOTE:	SYPRS	ETIGYLK    : ETFQLIG	)B 1; 55; 171;	ITY 3F		athur J , Koncz CYP90, ion in i	:e) :e) :heophyta			
	IGG   	YLKP! : LIGA!	Lei	CRC		C J., K CCZ C.; 90, a c in Arab	yta; sidae			
7777	IGGILGKWSMLVLVGD   :     : :    CNLLGKHSLLLMKGS	PYTATTL   AYKTENP	Length Indels	**	. 8 50 2	aus ytc	, St			P P D D D D D D D D D D D D D D D D D D
TIME TO A STATE OF THE PARTY OF	SMLV	adadı  - HODI	472; 41		h a EMBI tric tric is nd is	chmann chrome	eurosi			Q64459 P37123 P52786 O48928 Q27520 Q27589 P51590 P11707 Q642397 Q642397 P04167
	'LVGD :   MKGS	FMQQH  : : FIDER	1,		h a colla EMBL outs trictions is in nd for co -sib.ch/a	n A.	ophyt			mus mu solanu sorycto glycin caenor drosop rattus orycto mus mu mus mu orycto
101	131	1 71 2 63	Gaps		a collaboration BL outstation ictions on it is in no wa for commercia ib.ch/announce	50,	i a			
			<b>60</b>		· epacto	1 1 1 1				sculu m mel lagus e max habdi hila norv lagus sculu sculu lagus norv
			٠.		, Y-4 6 15	'				

δÃ

132 MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH 191

```
RESULT 2
CP85_LYCES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
Matches
              Query Match
Best Local :
                                                MEDIANE-3626705; PubMed-8672892;
Bishop G.J., Harrison K., Jones J.J.G.D.;
"The tomato Dwarf gene isolated by heterologous transposon tagging encodes the first member of a new cytochrome P450 family.";
Plant Cell 8:959-969(1996). THE OVERCHER DASH FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation update)
CYTOCHROME P450 85 (EC 1.14.-.-) (DWARF PRO
                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Lycopersicon esculentum (Tomato).
Eukaryota; Viridiplantae; Embryop
Magnoliophyta; eudicotyledons; cc
                                                                                                                                                                                         entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch)
                                                                                                                                                                                                                       modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CYP85 OR D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CP85_LYCES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        192
              Local Similarity
                                                                                                                                                                                                                                                                                                        SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DOPFAFPFVDFPNGLPIRVSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYETTSTIMTLAVKFLTETPLALAQLKEEHEKIRAMKSD--SYSLEWSDYKSMPFTQCVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DKLVFFPTTRTQKRYPIFVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NETLRVANIIGGVFRRAMTDVEIKGYKIPKGWKVFSSFRAVHLDPNHFKDARTFNPWRWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LMSFDPG-EWSESLRKEYLLVIEGFFSLPLPLFSTTYRKAIQAR-----RKVAEALT
 170;
 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SNSVTTGPSNVFTPFGGGPRLCPGYELARVALSVFLHRLVTGFSWVPAEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (EC 1.14.-.-) (DWARF PROTEIN).
            28.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                              Solanum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Embryophyta; Tracheophyta; Spermatophyta; ions; core eudicots; Asteridae; euasterids
 90;
            Pred.
                           Score 761.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -RKKDMLAALLAADDGFSDEEIVDFLVALLVA
              No. 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           update)
              .5e-42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                           DB 1;
                                                                                                                                                                                                                    Usage
                           Length 464;
Indels
                                                                                                                                                                                                                       by
                                                                                                                                                                                                                         and
61;
                                                                                                                                                                                                                       for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         278
                                                                                                                                                                                                                                                                                                                                                                                                                                                          H
10;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                             15-DEC-1998 (Rel. 37, C
15-DEC-1998 (Rel. 37, L
15-DEC-1998 (Rel. 37, L
CYTOCHROME P450 88A3 (E
CYP88A3 OR YUP8H12.23.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    3_ARATH
C883_ARATH
O23051;
                                                                    use by non-profit institutions as long a modified and this statement is not removed. entitles requires a license agreement (See lor send an email to license@isb-sib.ch).
                                                                                                                                                                                     Theologis A., Osborne B.I., Vysotskala V.S., Federspiel | Toriumi M., Yu G., Oji O., Araujo R., Chung E., Dewar K. Ecker J.R., Marziali A., Oefner P., Davis R.W.; Submitted (SEP-1997) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                   Arabidopsis thallana (Mouse-ear cress).

Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                             This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                          15-DEC-1998 (Rel.
15-DEC-1998 (Rel.
15-DEC-1998 (Rel.
               Pfam; PF00067;
                                         EMBL; AC000098; AAB71462.1;
                                                                                                                                                                                                                                                                STRAIN-CV.
                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                           NCBI_TaxID=3702;
                             InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Çī
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KFNWELAEDDOPFAFPFVDFPNGLPIRVS 510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PYSFNPWRWMDKS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RSMRFTRAVILETSRLATIVNGVLRKTTQDMEINGYIIPKGWRIYVYTRELNYDPRLYPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IEERR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHS----NLSTEQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LKQI----AGIESTSLAQEFMSEFFNLVLGTLSLPINLPNTNYHRGFQARKIIVNLLRTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AKHIMSMDPGEEET - - - EQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NGSAHKYMRGALLSLISPTMIRDQLLPKIDEFMRSHLTNW-DNKVIDIQEKTNKMAFLSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KNQRARYGSFFKSHILGCPTIVSMDSELNRYILVNEAKGLVPGYPQSMIDILGKCNIAAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LIFLSSFFGLCIFCTALLRWNQVKYNQKNLPPGTMGWPLFGETTEFLK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LLLLPSLLSLLLFLILLKRRN--RKTRFNLPPGKSGWPFLGETIGYLKPYTATTLG-DFM
            IPR001128;
0067; p450;
                                                                                                                                                                                                                                                                COLUMBIA;
                                                                                                                                                                                                                                                                                                                         Brassicaceae; Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STANDARD;
                                                                                                             rmatics Institute. There are no resi
                                                                                                                                                                                                                                                                                                                                                                                            , Last sequence up, Last annotation (EC 1.14.-.-).
                                                                                                                                                                                                                                                                                                                                                                                                                                           Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----LEHQNSFLVFGGGTRQCPGKELGVAEISTFLHYFVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----ASKEIQHDMLGYLMNEEATRFKLTDDEM
                                                                                                                                                                                                                                                                                                                                                                                                           update)
on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       490
                                                                                   (See http://www.isb-sib.ch/announce/
                                                                                                 Usage by
                                                                                                   and
                                                                                                                                                                                                                                                 z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -EDPIDYNDY
                                                                                                                                                                                                                                   Dietrich
                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               58
```

PR00385;

```
ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SQ SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 133
                                                                                                                                                SEQUENCE FROM N.A.
MEDLINE-97094702; PubMed-8939936;
White J.A., Guo Y.-D., Baetz K., Beckett-Jones B., Bonasoro J.,
Hsu K.E., Dilworth F.J., Jones G., Petkovich M.;
"Identification of the retinoic acid-inducible all-trans-retinoic
                                                                                                                                                                                                                                                     Brachydanio rerio (Zebrafish) (Zebra danio).
Bukaryota; Metazoa; Chordata; Craniata; Vertebrata; I
Actinopterygii; Neopterygii; Teleostei; Euteleostei;
Cypriniformes; Cyprinidae; Rasborinae; Danio.
NCBI_TaxID=7955;
                                                                                                                                                                                                                                                                                                                                             CP26_BRARE STANDARD; PRT; 492 AA. P79739; P79739; 15-DEC-1998 (Rel. 37, Created) 15-DEC-1998 (Rel. 37, Last sequence update) 15-DEC-1998 (Rel. 37, Last annotation update) CYTOCHROME P450 26 (EC 1.14.--) (RETINOIC ACID-METABOLIZING CYTOCHROME) (P450RAI) (RETINOIC ACID 4-HYDROXYLASE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BRARE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Oxidoreductase; Monooxygenase; Transmembrane; TRANSMEM 6 26 POTENTIAL.
BINDING 439 439 HEME (BY SIMILARI SEQUENCE 490 AA; 56409 MW; 7FDBCD7A8864D29
                                                                                                                                         acid
                                                                                                                           J. Biol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34 KTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVSKYGK--IYRSNLFGEPTIVS 91
INTLIFICATION OF CONTROL OF SEVERAL HYDROXYLATED FORMS INCLUDING 4-0X0-RALL PROPERTION OF SEVERAL HYDROXYLATED FORMS INCLUDING ALL-TRANS-RETINOIC ACID METABOLISM. FETENOIDS, INCLUDING ALL-TRANS-RETINOIC ACID (RA) AND IT STEREOISOMER 9-CIS-RA. CAPABLE OF 4-HYDROXYLATED FORMS RESPONSIBLE FOR GENERATION OF SEVERAL HYDROXYLATED FORMS INCLUDING 4-0H-RA AND 4-0X0-RA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FLPFGAGSHLCPGNDLAKLEISIFLHHFLLKYQVKRSNPECPVMY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EVLQRAKAEQEMILKSRPE-GQKGLSLKETRKMEFLSQVVDETLRVITFSLTAFREAKTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNLLNVK----DED-----GKTLDDEEIIDVLLMYLNAGHESSGHTIMWATVFLQEHP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYIPYIEENVITVLDKWTKMGEFEFLTHLRKLTFRII-MYIFLSSESENVMDALEREYTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTSDTCRRVLTDDD-AFKPGWPTSTMELIGRKSFVGISFEEHKRLRRLTAAPVNGHEALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ENRHYLPPGDLGWPFIGNMLSFLRAFKTSDPDSFTRTLIKRYGPKGIYKAHMFGNPSIIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VEMNGYLIPKGWKVLTWFRDVHIDPEVFPDPRKFDPARW---DNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LNYGVRAMAVNIPGFAYHRALKARKTLVAAFQSIVTERR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                {\tt ILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVT}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PS00086;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CYTOCHROME_P450; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21.6%;
28.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ME (BY SIMILARITY)
7FD8CD7A8864D298 C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              579.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4.3e-3
                                                                                                                                                                                                                                                                                                     Vertebrata; Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                192;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NORKONILSNKKDML
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   473
                                                                                                                                                                                                                                                                                      Ostariophysi;
                                                                                         AND ITS
                                                         HYDROXYLATION FORMS OF RA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ω
ω
                                                                                                         ACTS ON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9
```

RESULT 5
C881\_MAIZE
ID C881\_M
AC Q43246
DT 15-DEC
DT 15-DEC
DT 15-DEC
DT 15-DEC
CYTOCH
GN CYP88A

STANDARD;

PRT;

519

₽

C881\_MAIZE Q43246; 15-DEC-1998 15-DEC-1998 15-DEC-1998 CYTOCHROME P CYP88A1 OR D

8 (Rel. 37, Created)
8 (Rel. 37, Last sequence update)
8 (Rel. 37, Last annotation update)
P450 88A1 (EC 1.14.-.-) (DWARF3 PRD3.

(DWARF3 PROTEIN).

```
SO THE STATE OF TH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                            δ.
                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
밁
                                                                δÃ
                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN the European Bioinformatics Institute. There are no restricted the companion of the companion of the control of the companion of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Oxidoreductase; Monooxygenase; Membrane; Heme; Endoplasmic reticulum.
BINDING 438 438 HEME (BY SIMILARI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ZFIN; ZDB-GENE-990415-44; cyp26.
InterPro; IPR001128; -.
Fiam; PF00067; p450; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entities requires a license agreement (See http://www.isb-sib.ch/announce,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRINTS; PR00385; P450.
PROSITE; PS00086; CYTOCHROME_P450;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; U68234; AAC60045.1;
443
                                                                         467
                                                                                                                                                               392
                                                                                                                                                                                                                                             407
                                                                                                                                                                                                                                                                                                                               332
                                                                                                                                                                                                                                                                                                                                                                                                             351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INDUCTION: BY RETINOIC ACIDS (RA).
SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HTLLPLLLLPSLLSLLLFL------ILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKP
FAKVLLKIFLVELTQHCNWILSNGPPTMKTGPTIYPVDNLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YTLMVTFLCTIVLPVLLFLAAVKLWEMLMIRRVDPNCRSPLPPGTMGLPFIGETLQLI--
                                                                         LAKLEMAVFIHHLVLKFNWELAEDDQ-----
                                                                                                                                                               YSICDTHDVADVFPNKEEFQPERFM-----
                                                                                                                                                                                                                                     PVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSE
                                                                                                                                                                                                                                                                                                                           MGMYTPGKGLSMELLDQLKYTGCVIKETLRINPPVPGGFRVALKTFELNGYQIPKGWNVI
                                                                                                                                                                                                                                                                                                                                                                                                             --- 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----PFSLQAMKEAATELLFGGHETTASTATSLVMFLGLNTEVVQKVREE-----VQEKVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GLRAR----IENSRRSDE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CVLVYPEMKKLMFRIAMRILLGFEPEQIKTDEQELVEAFEEMIKNLFSLPIDVPFSGLYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IFSAQDEAKKFTFNLMAKHIMSMDPGEEET---EQLKKEYVTFMKGVVSAPLNLPGTAYHK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ILGSDTLSNVHGVQHKNKKKAIMRAFSRDALEH-----YIPVIQQEVKSAIQEWLQKDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ILGKWSMLVLVGDMHRD-----MRSISLNFLSHARLRTILLKDVERHTLFVLDSW-QQNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ---LORRKFLRMKROKYGCIYKTHLFGNPTVRVMGADNVRQILLGEHKLVSVQWPASVRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     non-profit institutions as long as its content is in no requires a license agreement.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   492 AA;
                                                                                                                                                                                                                                                                                                                                                                                                         -ESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   56281 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18
27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HEME (BY SIMILARITY).
FD471435B2F30509 CF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          503;
No. 3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   <u>ب</u>
                                                                             PFAFPFVDFP
                                                                                                                                                               -SKGLEDGSRF--NYIPFGGGSRMCVGKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 1; 1
3.4e-25;
nes 216;
483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 492;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      58
                                                                                                                                                                                                                                                                                                                                                                                                             406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             230
                                                                                                                                                                                                                                                                                                                               391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               279
```

STILL BURNESS OF THE STREET OF

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BINDING
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A. STRAIN-CV. B73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        in Gibberellin biosynthesis.";
Plant Cell 7:1307-1317(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Winkler R.G., Helentjaris T.;
"The maize Dwarf3 gene encodes a cytochrome P450-mediated early step
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Magnoliophyta; Liliopsida; Andropogoneae; Zea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Oxidoreductase; Monooxygenase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=96004534; PubMed=7549486;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=4577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Viridiplantae;
                                                                                                                                                                                                                                                   306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CRANSMEM
  446
                                                                                                                                                   343
                                                                                                                                                                                                   326
                                                                                                                                                                                                                                                                                                266
                                                                                                                                                                                                                                                                                                                                                 246
                                                                                                                                                                                                                                                                                                                                                                                                 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PATHWAY: EARLY STEP IN GIBBERELLIN BIOSYNTHESIS.
TISSUE SPECIFICITY: EXPRESSED IN ROOTS, DEVELOPING
VEGETATIVE MERISTEM, AND SUSPENSION CULTURE CELLS.
SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                              YLPFIDRTYTSSLRAWADHGGSVEFLTELRRMTFKIIVQ-IFLGGADQATTRALERSYTE
STWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF
                                                                                                RKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSF
                                                                                                                                                   FLQENPDMFARAKAEQEAIMRSIPS-SQRGLTLRDFRKMEYLSQVIDETLRLVNISFVSF
                                                                                                                                                                                              FLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLH
                                                                                                                                                                                                                                                   QDE-----
                                                                                                                                                                                                                                                                                              EDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIF
                                                                                                                                                                                                                                                                                                                                                 LNYGMRAMAINLPGFAYRGALRARRRLVAVLQGVLDERRAARAKGVSGGGVDMMDRLIEA
                                                                                                                                                                                                                                                                                                                                                                                                 FMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKLDIKE-----EDQEEEEEVKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LLKDVERHTLFVLDSW-QQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AEGCKQVLMDDDA--FVTGWPKATVALVGPRSFVAMPYDEHRRIRKLTAAPINGFDALTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTI 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RENLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVSKYGK--IYRSNLFGEPTI-VSA 92
                                                  RQATRDVFVNGYLIPKGWKVQLWYRSVHMDPQVYPDPTKFDPSRWE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RARLPPGEMGWPLVGGMWAFLRAFKSGKPDAFIASFVRRFGRTGVYRSFMFSSPTVLVTT 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      U32579; AAC49067.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             al Similarity
129; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PF00067; P450;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a requires a license agreement (See http://www.isb-sib.ch/announce/
an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PS00086;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IPR001128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 466
519 /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA;
                                                                                                                                                                                                                                                   RGRHLDDD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CYTOCHROME_P450; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 466
57906 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Embryophyta; Tracheophyta; Spermatophyta;
; Poales; Poaceae; PACC clade; Panicoideae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 491.5; DB
Pred. No. 2e-24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      POTENTIAL.
HEME (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Transmembrane; Heme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0F8977A024316D95 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                ----EIIDVLVMYLNAGHESSGHITMWATV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LEAVES,
                                                  -GHSPRAGTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          519;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                   401
                                                                                                                                                                                                                                                                                                                                                                                                                                            245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            186
                                                                                                                                                                                                                                              342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11;
```

Ş

밁

```
Š
                                                                                                                                                                                                                                                                                                              STREET REPRESENTATION OF THE PROPERTY OF THE P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
CP26_MC
  밁
                                                                                          В
                                                                                                                                    Qy
                                                                                                                                                                                          Matches
                                                                                                                                                                                                              Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JLT 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CP26_MOUSE
055127;
15-DEC-1998
                                                                                                                                                                                                                                                                                                           Endoplasmic reticulum.
BINDING 442 442
SEQUENCE 497 AA; 56
                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; Y12657; CAA73206.1; -.
MGD; MGI:1096359; Cyp26.
MGHerPro; IPR001128; -.
Pfam; PF00067; p450; 1.
PRINTS; PR00385; P450.
PROSITE; PS00086; CYTOCHROME_P450; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15-DEC-1998 (Rel. 37, Last sequence update)
01-CCT-2000 (Rel. 40, Last annotation update)
CYTOCHROME P450 26 (EC 1.14.-.) (RETINOIC ACID-METABOLIZING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Metabolic inactivation of retinoic acid by a novel P450 differentially expressed in developing mouse embryos."; EMBO J. 16:4163-4173(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Metazoa; Chordata; Mammalia; Eutheria; Rodentia; MCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CYTOCHROME) (P450RAI) (RETINOIC ACID 4-HYDROXYLASE) CYP26A1 OR CYP26 OR P450RA.
                                                                                                                                                                                                                                                                                                                                                                             Oxidoreductase; Monooxygenase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 entities requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE-98113212; PubMed-9442090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-97392446; PubMed-9250660; Fujli H., Sato T., Kaneko S., Got
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mus musculus (Mouse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
  59
                                                                                                                                         10
                                              58
                                                                                          ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INDUCTION: BY RETINOIC ACIDS (RA).
SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                            PYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIG
                                                                                                                                       LPLLLLPSL----LSLLLFLILLK------RRNRKTRFNLPPGKSGWPFLGETIGYLK
                                                                                             LPALLASALCTFVLPLLLFLAALKLWDLYCVSSRDRSCALPLPPGTMGFPFFGETL----
-QMVLQRRKFLQMKRRKYGFIYKTHLFGRPTVRVMGADNVRRILLGEHRLVSVHWPASVR
                                                                                                                                                                                          148;
                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hamada H.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FROM N.A
                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                           442
56177 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Chordata; Craniata; Vertebrata; I
Rodentia; Sciurognathi; Muridae;
                                                                                                                                                                                                              17.28; 28.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Created)
                                                                                                                                                                                          78;
                                                                                                                                                                                                              Score 461; DB 1;
Pred. No. 1.6e-22;
                                                                                                                                                                                                                                                                                                           HEME (POTENTIAL).
; 33B07D7C29134471 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gotoh O.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                  Membrane;
                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fujii-Kuriyama Y.,
                                                                                                                                                                                                                                                                                                                                                                                  Heme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ξ
                                                                                                                                                                                                                                                                                                                                                                                  Microsome;
                                                                                                                                                                                                                                      Length 497;
                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Murinae; Mus.
                                                                                                                                                                                        64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Osawa
                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ~
                                                                                                                                         57
                                                                                                                                                                                          14:
```

HEART

```
RESULT 7
CP26_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
          맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
CEPHALIC TISSUES.";

CEPHALIC TISSUES.";

BIOCHEM. BIOPHYS. Res. Commun. 252:487-491(1998).

FUNCTION: PLAYS A KEY ROLE IN RETINOIC ACID METABOLISM. ACTS ON RETINOIDS, INCLUDING ALL-TRANS-RETINOIC ACID (RA) AND ITS STERROISOMER 9-CIS-RA, CAPABLE OF BOTH 4-HYDROXYLATION AND 18-HYDROXYLATION. RESPONSIBLE FOR GENERATION OF SEVERAL HYDROXYLATED FORMS OF RA, INCLUDING 4-OH-RA, 4-OXO-RA, AND 18-OH-RA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last sequence update)
01-OCT-2000 (Rel. 40, Last annotation update)
CYTOCHROME P450 26 (EC 1.14.-.-) (RETINOIC ACID-METABOLIZING CYTOCHROME) (P450RAI) (RETINOIC ACID 4-HYDROXYLASE).
CYP26A1 OR CYP26.
                                                                                                                                      TISSUE SPECIFICITY.
MEDLINE=99045433; PubMed=9826557;
Trofimova-Griffin M.E., Juchau M.R.;
"Expression of cytochrome P450RAI (CYP26) in human
                                                                                                                                                                                                                          Sonneveld E., van den Brink C.E., van der Leede B.M., Schu Petkovich M., van der Burg B., van der Saag P.T.; "Human retinoic acid (RA) 4 hydroxylase (CYP26) is highly all-trans-RA and can be induced through RA receptors in hu and colon carcinoma cells."; Cell Growth Differ. 9:629-637(1998).
                                                                                                                                                                                                                                                                                                                                                                               Jones G., Petkovich M.; "Jones G., Petkovich M.; "CDNA cloning of human retinoic acid-metabolizing identifies a novel family of cytochromes P450."; J. Biol. Chem. 272:18538-18541(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CP26_HUMAN O43174;
                                                                                                                                                                                                                                                                                                                                 MEDLINE-98380037;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=97373542; PubMed=9228017;
White J.A., Beckett-Jones B., Guo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Primates;
                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HOMO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FAKILLK I FTVELARHCDWQLLNGPPTMKTSPTVYPVDNLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YSICDTHDVADIFTNKEEFNPDRFIVPHPEDASRFS-----FIPFGGGLRSCVGKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LCKSNQDNKLDMETLEQLKYIGCVIKETLRLNPPVPGGFRVALKTFELNGYQIPKGWNVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TILGAGCLSNLHDSSHKQRKKVIMQAFSREALQCYVLV-IAEEVSSCLEQWLSCGERGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQ--NSIFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LAKLEMAVFIHHLVLKFNWELAE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSE 466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVL 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---ALKQS--STE----LLFGGHETTASAATSLITYLGLYPHVLQKVREEIKSKGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VKARNLIHARIEENIRAKIRRLQATEPDGGCKDALQLLIEHSWE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LQSRATILKFIERKMEE--RKLDIKEED---QEEEEVKTEDEAEMSKSDHVRKQRTDDDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VYPEVKRLMFRIAMRILLGCEPGPAGGGEDEQQLVEAFEEMTRNLFSLPIDVPFSGLYRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AQDEAKKFTFNLMAKHIMSMDPGE----EETEQLKKEYVTFMKGVVSAPLNLPGTAYHKA
                                                                                                                                                                                                                                                                                                                                                 N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                               PubMed=9716180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Craniata; Vertebrata;
Catarrhini; Hominidae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -DDQPFAFPFVDFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Y.-D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            497
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dilworth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hominidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                487
                                                                                                                                                                                                                                                                                                                                                                                                                                                    F.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                    enzyme
                                                                                                                                             fetal hepatic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Euteleostomi;
                                                                                                                                                                                                                                                                                                                 Schulkes
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bonasoro
                                                                                                                                                                                                                                                                                                                                                                                                                    (hP450RAI)
                                                                                                                                                                                                                                                                                 specific for
                                                                                                                                                                                                                                                                 breast
                                                                                                                                                                                                                                                                                                                  R.K.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231
```

```
RESULT 8
YRV2_CAEEL
ID YRV2_C
AC Q27514
DT 01-NOV
DT 01-NOV
DT 30-MAY
                                                                                                                                                                                                                                                                                                  ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                               QΨ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρy
                                                                                                                                                                                                          망
                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                      Д
                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Endoplasmic reticulum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pfam; PF00067; p450; 1.
PRINTS; PR00385; P450.
PROSITE; PS00086; CYTOCHROME_P450; 1.
Oxidoreductase; Monooxygenase; Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AF005418; AAB88881.1; MIM; 602239; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             118
                                                                                                                                                                                                                                        403
                                                                                                                                                                                                                                                                                                                                                                                                    233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                173
                                                                                                                                             443
                                                                                                                                                                           463
                                                                                                                                                                                                                                                                        332
                                                                                                                                                                                                                                                                                                                                     286
                                                                                                                                                                                                                                                                                                                                                                     283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10 LPLILLPSL----LSLLLFLILLK------RRNRKTRFNLPPGKSGWPFLGETIGYLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TISSUE SPECIFICITY: HIGHEST LEVELS IN ADULT LIVER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INDUCTION: BY RETINOIC ACIDS (RA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PITUITARY GLAND, ADRENAL GLAND, PLACENTA AND REGIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GILGKWSMLVLVGDMHRDMRSISLNFLSHARLR---TILLKDVERHTLFVLDSWQQ--NS
                                                                                                                                                                                                                                                                                                                                                                                                   LYRGMKARNLIHARIEQNIRAKICGLRASEAGQGCKDALQLLIEHSWE-----RGERL
                                                                                                                                                                                                                                                                                                                                                                                                                                                              GLLVYPEVKRLMFRIAMRILLGCEPQLAGDGDSE-QQLVEAFEEMTRNLFSLPIDVPFSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TILGSGCLSNLHDSSHKQRKKVIMRAFSREALECYVPVITEEVGSS----LEQWLSCGER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LPALLASALCTFVLPLLLFLAAIKLWDLYCVSGRDRSCALPLPPGTMGFPFFGETL----
                                                                                                                                             VGKEFAKILLKIFTVELARHCDWQLLNGPPTMKTSPTVYPVDNLP
                                                                                                                                                                           AGSELAKLEMAVFIHHLVLKFNWELAE-----DDQPFAFPFVDFP
                                                                                                                                                                                                                                      WKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLC
                                                                                                                                                                                                                                                                        SKGLLCKSNQDNKLDMEILEQLKYIGCVIKETLRLNPPVPGGFRVALKTFELNGYQIPKG
                                                                                                                                                                                                                                                                                                    EIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSG 402
                                                                                                                                                                                                                                                                                                                                                                   DDDLLGWYLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IFSAQDEAKKFTFNLMAKHIMSMDP-----GEEETEQLKKEYVTFMKGVVSAPLNLPGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIG 117
                                                                                                                                                                                                          WNVIYSICDTHDVAEIFTNKEEFNPDRFMLPHPEDASRFS---
                                                                                                                                                                                                                                                                                                                                                                                                                                 YHKALQSRATILKFIERKMEERKLDIKEED-----QEEEEVKTEDEAEMSKSDHVRKQRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -QMVLQRRKFLQMKRRKYGFIYKTHLFGRPTVRVMGADNVRRILLGDDRLVSVHWPASVR 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         142;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IPR001128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    442 I
56162 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HEME (POTENTIAL).
EAB6B84B24B2EAB3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
                                                                                                                                                                                                                                                                                                                                     LLFGGHETTASAATSLITYLGLYPHVLQKVREELK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     e 438; DB 1;
No. 4.9e-21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Heme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         226;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Microsome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                              487
                                                                                                                                                                           502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BRAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          57
                                                                                                                                                                                                                                        462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          58
                                                                                                                                                                                                            442
                                                                                                                                                                                                                                                                                                                                       331
                                                                                                                                                                                                                                                                                                                                                                   342
                                                                                                                                                                                                                                                                                                                                                                                                   285
                                                                                                                                                                                                                                                                                                                                                                                                                                 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              227
                                                                                                                                                                                                                                                                        391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15;
```

YRV2\_CAEEL Q27514; Q1-NOV-1997 Q1-NOV-1997 30-MAY-2000

(Rel. (Rel. (Rel.

35,35

Last

sequence

update)

Last annotation update)

Created)

STANDARD;

PRT;

520

B

```
멍
                                  Š
                                                                        밁
                                                                                                      Š
                                                                                                                                              ₽
                                                                                                                                                                              Ş
                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                            오. 문
                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                    D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WormPep; T10B9.2; CE01656.
InterPro; IPR001128; -.
InterPro; IPR002402; -.
Pfam; PF00067; P450; 1.
PRINTS; PR00385; P450.
PRINTS; PR00464; EP450II.
PROSITE; PS00086; CYTOCHROME P450; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (MAR-1995) to the EMBL/GenBank/DDBJ databases.
-I- FUNCTION: CYTOCHROMES P450 ARE A GROUP OF HEME-THIOLATE
MONOOXYGENASES. THEY OXIDIZE A VARIETY OF STRUCTURALLY UNRELATED
COMPOUNDS, INCLUDING STEROIDS, FATTY ACIDS, AND XENOBIOTICS.
-I- SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Hypothetical protein; Oxidoreductase; Monooxygenase; Heme BINDING 464 464 HEME (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A. STRAIN-BRISTOL N2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Eukaryota; Metazoa; Nematoda; Chromadorea; Rhabditida; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; Z48717; CAA88604.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID-6239;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Caenorhabditis elegans.
 409
                                                                                                                                                                                                                                                                                                                                                                                                      148
                                                                                                                                                                                                                        253
                                                                                                                                                                                                                                                                                              193
                                                                                                                                                                                                                                                                                                                                                                  140
                                                                                                                                                                                                                                                                                                                                                                                                                                        83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \mathfrak{s}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  42
 IEKGTNVQVDTWTLHYDPKVWGEDANEFRPERWE-
                                  IPSGWKVLPVISAVHLDNSRY-DQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGG 457
                                                                      E-----VDRECPNPEVTFDQISKLKYMECVVKEALRMYPLASIVHNRKCMKETNVLGVQ
                                                                                          EHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLH-RKALKDVRYKGYD
                                                                                                                                                OLTFDEIIG
                                                                                                                                                                                QRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELRE
                                                                                                                                                                                                                    LNKRLEQRAADEKAGIEPSGEPQDFIDLFLDARANVDFFEEESALGFAKTEIAKVD---K
                                                                                                                                                                                                                                                      IERKMEERKLDIKE-----EDQ------EEEEVKTEDEAEMSKSDHVRK
                                                                                                                                                                                                                                                                                          SLMFRNPMLPKVKGIFKDGRKLPFLVSGIFPIAGTMFREFFMRFPSIQPAFDIMSTVEKA
                                                                                                                                                                                                                                                                                                                            TEQLKKEYVTFMKGV------VSAPLNLPGTAYHK-----ALQSRATILKF
                                                                                                                                                                                                                                                                                                                                                                NLRKIMSTVEETVVELMRH----LDDASAKGKAVDLLDYYQEFTLDIIGRIAM-----GQTE 192
                                                                                                                                                                                                                                                                                                                                                                                                  RLRTIL-----LKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEE
                                                                                                                                                                                                                                                                                                                                                                                                                                    P---EFVHEVFVKQFDNFYGRKTNPIQGDPNKNKRAHLVSAQGHRWKRLRTLSSPTFSNK 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPRGFPFFGVIHEFQDYENPGLLK-----LGEWTKE----YGPIYGITEGVEKTLIVSN 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKSGWPFLG-----ETIGYLKPYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGLNRFILQNEGRLFECSYPRSIGGILG-----KWSMLVLV-GDMHRDMRSISLNFLSHA 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity 23.0
20; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OR T10B9.2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             520 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12.1%;
23.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59524 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CYP13A5 (EC 1.14.-.-).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94;
                                                                                                                                              --QLFVFLLAGYDTTALSLSYSSYLLARHPEIQKKLQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 324.5; DB 1;
Pred. No. 9.2e-14;
4; Mismatches 178;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0B7B19E25B7ADF3B CRC64;
-SGDELFYAKG-GYLPFGM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    117;
                                                                                                                                                                                                                                                        279
459
                                                                                                                                              354
                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20;
```

```
γQ
                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                               Q
밁
                                          Ş
                                                                                              밁
                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; irnovalor:
InterPro; ipR00402; -
InterPro; ipR00402; -
Pfam; pF00067; p450; 1.
PRINTS; pR00464; EP450; 1.
PROSITE; pS00086; CYTOCHROME_P450; 1.
PROSITE; pS00086; P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YRVA_CAEEL
Q27519;
Q1-NOV-1997
Q1-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entre the European Bioinformatics Institute. There are no restructe by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-NOV-1997 (Rel. 35, Last sequence update) 30-MAY-2000 (Rel. 39, Last annotation updat putative Cyrochroke P450 Cyp13A7 (EC 1.14.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CAEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota; Metazoa; Nematoda; Rhabditidae; Peloderinae; Cae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WormPep; T10B9.10; CE01655.
InterPro; IPR001128; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; Z48717; CAA88609.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gardner A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-BRISTOL N2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Caenorhabditis elegans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CYP13A7 OR T10B9.10.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=6239;
244
                                                                                              188
                                                                                                                                          193
                                                                                                                                                                                         140
                                                                                                                                                                                                                                        148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           458 GPRLCAGSELAKLEMAVFIHHLVLKFNWE
                                                                                                                                                                                                                                                                                       83
                                                                                                                                                                                                                                                                                                                                    94
                                                                                                                                                                                                                                                                                                                                                                                   \mathfrak{S}
                                                                                                                                                                                                                                                                                                                                                                                                                                  42
DIOSILEKALNKR-LEQREADEKAGIEPSGEPQDFIDLFLDARSTVDFFEGEAEQDFAKS
                                                                                                                                                                                                                                                                                                                                                                                                                             GKSGWPFLG-----ETIGYLKPYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPRICIGMRLAMMEKKMLLTHILKKYTFE
                                                                                                                                        MSMDPGEEET-----EQLKKEYYTFMKG-----VVSAPLNLPGTAYHK-----ALQSRA
                                                                                                                                                                                       SLRKIMGTVEESVTELVRSLEKASAEGKTLDMLEYYQE---
                                                                                                                                                                                                                                                                                                                                 AGLNRFILQNEGRLFECSYPRSIGGILG-----KWSMLVLVGDMHRDMRSISLNFLSHA 147
                                                                                                                                                                                                                                                                                                                                                                                   GPRGLPFLGVIHKFTNYENPGALK ------FSEWTKKYGPVYGITEGVEKTLVISD 82
                                               TILKFIERKMEERKLDIKEEDQE---
                                                                                                                                                                                                                                                                                       P---EFVHEVFVKQFDNFYGRKLTAIQGDPNKNKRVPLVAAQGHRWKRLRTLASPTFSNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                              GQEKSLMFRNPMLDKVKTIFKEGRNNVFMISGIFPFVGIALRNIFAKFPSLQMAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Peloderinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                   ---LLKDVER----HTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12.0%;
24.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Caenorhabditis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Chromadorea; Rhabditida; Rhabditoidea;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                               EEEVKTEDEAEM - - - - - SKSDHVRKQRTDDDLLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               321.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           n update)
1.14.-.-).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .4e-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            184;
                                                                                                                                                                                         -----FTMDIIGKMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 518;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a collaboration -
MBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UNRELATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                                                                                               93
302
                                               288
                                                                                              243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20;
```

밁 ğ 망 Q 뫄 Š В Š

```
C912_AR
C912_AR
C912_AR
C912_AR
C912_AR
C065790
PT 01-OCT
DT 01-OCT
DT 01-OCT
DT CYPOLA
GN CYP91A
OC Eukary
OC Magnoll
OC Magnoll
OC MAGNOLL
RN MEDLIN
RR ME
                    RA Langham S.-A., McCullagh B., Bilham L., Robber J.,

RA Langham S.-A., McCullagh B., Bilham L., Robber J.,

RA Van der Schueren J., Grymonprez B., Chuang Y.-J., Vandenbussche F.,

RA Braeken M., Weltjens I., Voet M., Bastlaens I., Aert R., Defoor E.,

RA Holzer E., Brandt A., Peters S., van Staveren M., Dirkse W.,

RA Holzer E., Brandt A., Peters S., van Staveren M., Dirkse W.,

RA Holzer E., Brandt A., Peters S., van Staveren M., Dirkse W.,

RA Holzer E., Brandt A., Peters S., van Staveren M., Dirkse W.,

RA Holzer E., Brandt A., Peters S., van Staveren M., Dirkse W.,

RA Holzer E., Brandt R., Rose M., Hauf J., Koetter P.,

RA Holzer E., Brandt R., Rose M., Hauf J., Koetter P.,

RA Holzer E., Brandt R., Rose M., Hauf J., Koetter P.,

RA Holzer E., Hange S., Feldpausch M., Hauf J., Koetter P.,

RA De Keyser A., Buysshaert C., Gielen J., Villarroel R., De Clercq R.,

RA Clark L., Doggett J., Hall S., Kay M., Lennard N., McLay K., Mayes R.,

RA Pettett A., Rajandream M.-A., Lyne M., Benes V., Rechmann S.,

RA Pettett A., Rajandream M.-A., Lyne M., Grimm M., Loehnert T.-H.,

RA Dose S., de Haan M., Maarse A., Schaefer M., Mueller Auer S.,

RA Gabel C., Fuchs M., Fartmann B., Granderath K., Dauner D., Herzl A.,

RA Gabel C., Fuchs M., Fartmann B., Granderath K., Dauner D., Herzl A.,

RA Massenet O., Quigley F., Clabauld G., Muendlein A., Felber R.,

RA Schnabl S., Hiller R., Schmidt W., Lecharny A., Aubourg S.,

RA Chefdor F., Cooke R., Berger C., Monfort A., Casacuberta E.,

RA Petez-Perez A., Purnelle B., Bent E., Johnson S., Tacon D., Jesse T.,

RA Heijnen L., Schwarz S., Scholler P., Heber S., Francs P., Bielke C.,

RA Fishman D., Hanse N. Lenker K. Meese H.-W. Stocker S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                065790; Q9SZU3;
01-0CT-2000 (Rel. 40, Created)
01-0CT-2000 (Rel. 40, Last sequence update)
01-0CT-2000 (Rel. 40, Last annotation update)
CYTOCHROME P450 91A2 (EC 1.14.--)
CYP91A2 OR AT4G37430 OR F6G17.80.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mizutani M., Ward E., Ohta D.;
"Cytochrome P450 superfamily in Arabidopsis thaliana: isolation cDNAs, differential expression, and RFLP mapping of multiple cytochromes P450.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mayer K.F.X., Schueller C., Wambutt R., Murphy G., Volckaert G., Pohl T., Duesterhoeft A., Stiekema W., Entian K.-D., Terryn N., Harris B., Ansorge W., Brandt P., Grivell L., Rieger M., Weichselgartner M., de Simone V., Obermaier B., Mache R., Muelle Weichselgartner M., de Simone V., Obermaier B., Mache R., Muelle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-CV. COLUMBIA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Plant Mol. Biol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Kreis M., Delseny M., Puigdomenech P., Watson M., Schmidtheini T. Reichert B., Portetelle D., Perez-Alonso M., Boutry M., Bancroft
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=20083488; PubMed=10617198;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=98281573;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Brassicales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C912_ARATH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RLAMMEMKMLLTNILKNYTFE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ELAKLEMAVFIHHLVLKFNWE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLH-RKALKDVRYKGYDIPSGWKVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WVLK-HSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VDTWSLHHDPKVWGDDVNEFKPERWE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVISAVHLDNSRY-DQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DRECPDPEVTFDQLSKLKYLECVVKEALRLYPLASLVHNRKCLKTTNVLGMEIEAGTNIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EVLKVDKHLTFDEIIGQLFVFLLAGYDTTALSLSYSSYLLATHPEIQKKLQEE-----V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hoheisel J., Zimmermann W., Wedler H., Ridley P., S.-A., McCullagh B., Bilham L., Robben J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COLUMBIA; TISSUE-Seedling;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Brassicaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         37:39-52(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PubMed=9620263;
E., Ohta D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
P., Heber S.,
Mewes H.-W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SGDELFFAKG-GYLPFGMGPRICIGM 467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mueller M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Η.,
```

```
SQUETTITE TO DRESENTE TO SQUETTITE TO SQUETE TO SQUETE TO SQUETTITE SQUETE SQUE
                                                                                                                QΥ
                                                                                                                                                                                 밁
                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RA Zaccaria P., Bevan M., Wilson R.K., de la Bastide M., Habermann K., Aparnell L., Dedhia N., Gnoj L., Schutz K., Huang E., Splegel L., Ra Sehkon M., Murray J., Sheet P., Cordes M., Abu-Threideh J., Sconeking T., Kalicki J., Graves T., Harmon G., Edwards J., Stoneking T., Kalicki J., Graves T., Harmon G., Edwards J., Latreille P., Courtney L., Cloud J., Abbott A., Scott K., Johnson D., Aminx P., Bentley D., Fulton B., Miller N., Greco T., Kemp K., Ra Kramer J., Fulton L., Mardis E., Dante M., Pepin K., Hillier L., Ra Nelson J., Spieth J., Ryan E., Andrews S., Geisel C., Layman D., Ra Nelson J., Spieth J., Ryan E., Andrews S., Geisel C., Layman D., Ra Nelson J., Spieth J., Ryan E., Andrews S., Geisel C., Layman D., Ra Antonoiu B., Zidanic M., Strong C., Sun H., Lamar B., Yordan C., Ra Antonoiu B., Zidanic M., Strong C., Sun H., Lamar B., Yordan C., Ra Ma P., Zhong J., Preston R., Vil D., Shekher M., Matero A., Shah R., Swaby I.K., O'Shaugnessy A., Rodriguez M., Hoffman J., Till S., Shohdy N., Hasegawa A., Hameed A., Lodhi M., Johnson A., Chen E., Marra M., Martienssen R., McCombie W.R.;

"Sequence and analysis of chromosome 4 of the plant Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Oxidoreductase; N
BINDING 438
CONFLICT 106
CONFLICT 127
CONFLICT 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; D78607; BAA28539.1; -. EMBL; AL035601; CAB38210.1; -. EMBL; AL161591; CAB80408.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pfam; PF00067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nature 402:769-777(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              InterPro;
   325
                                                              254
                                                                                                                                                                                                                                         217
                                                                                                                                                                                                                                                                                                        164
                                                                                                                                                                                                                                                                                                                                                                                                                           110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           European Bioinformatics Institute. The by non-profit institutions as long filed and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LLPLLLLPSLLSLLLFLILLKR--RNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGD 66
                                                                                                                                                                                                                                                                                                  ---NESNDFTHIELEPLLSDLTFNNIVRMYTGKRYYGDDVNNKEEAELFKK------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GILGKWSMLVLVGDMHRDMRSI-SLNFLSHARLRTI--LLKDVERHTLFVLDSWQQNSIF
FFLQACPKAVEELREEHLEIARAKKELGESEL-NWDDYKKMDFTQCVINETLRLGNVVRF 383
                                                                                                                                                                                                                                                                                                                                                                                                                        TTVG----TAPYGDHWRNLRRICSQEILSSHRLINFQHIRKDEILRMLTRLSRYTQTS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LLQRYSNQYGPIF-SLRFGSRRVVVITSPSLAQESFTGQNDIVLSSRPLQLTAKYVAYNH 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FMQQHVSKYGKIYRSNLFGEPTIV-----SADAGLNRFILQNEGRLFECSYPRSIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MLYFILLP----LLFLVISYKFLYSKTQRFNLPPGPPSRPFVGH-LHLMKP----PIHR
                                                           LQRLLDECRRDKEGNTMVNHLISLQQQQPEYYTDVIIKGLMMSMMLAGTETSAVTLEWAM
                                                                                                                EMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILD-----LILSLLFAGHETSSVAIALAI 324
                                                                                                                                                                                                                                      VSAPLNLPGTAYHKALQSRAT-----ILKFIERKMEERKLDIKEEDQEEEEVKTEDEA
                                                                                                                                                                                                                                                                                                                                                             SAQDEAKKFTF - - - - - - NLMAKHIMSMDPG - - - - - - EEETEQLKKEYVTFMKGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29894;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PS00086; CYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9894; Arath;1113;29894.
IPR001128; -.
                                                                                                                                                                              -----LVYDIAMYSGANHSADYLPILKLFGNKFEKEVKAIG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ĀĀ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Monooxygenase;
438 H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CYTOCHROME_P450; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        106
127
140
454
57555 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11.8%;
25.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HEME (BY SIMILARITY).
A -> V (IN REF. 1).
I -> M (IN REF. 1).
N -> I (IN REF. 1).
S -> T (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 316; DB 1;
Pred. No. 3.1e-13;
3; Mismatches 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OFB453D2070EA2EA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Membrane; Heme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              There are no restrictions ong as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        118;
                                                                                                                                                                                 KSMDDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        commercia]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          117
                                                                                                                                                                                 253
                                                                                                                                                                                                                                                                                                                                                                                                                           163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        50
                                                                                                                                                                                                                                                                                                  211
                                                                                                                                                                                                                                                                                                                                                             216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22;
```

```
ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT
            EMBL;
                                       EMBL;
                                                                                                                                                                                                                                                                                                                                                       Miyata M., Nagata K., Shimada M., Yamazoe Y., Kato R., "Structure of a gene and cDNA of a major constitutive testosterone 6 beta-hydroxylase (P450/6 beta A) encodi comparison of the cDNA with P450PCN2.", Arch. Biochem. Biophys. 314:351-359(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-SPRAGUE-DAWLEY; TISSUE-Liver;
MEDLINE-9124339; PubMed=2043144;
Miyata M., Nagata K., Yamazoe Y., Kato R.;
"A gene structure of testosterone 6 beta-hydroxylase
"Blochem. Blophys. Res. Commun. 177:68-73(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13-AUG-1987 (Rel. 05, Created)
15-JUL-1999 (Rel. 38, Last sequence update)
15-JUL-1999 (Rel. 38, Last annotation update)
CYTOCHROME P450 3A2 (EC 1.14.14.1) (CYPIIIA2)
BETA-A) (TESTOSTERONE 6-BETA-HYDROXYLASE).
                                                                     EMBL;
                                                                                                or send an email t
                                                                                                                              modified and
                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a continuous the Swiss Institute of Bioinformatics and the EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN-SPRAGUE-DAWLEY; MEDLINE-95070139; PubMe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rattus norvegicus (Rat).
Eukaryota; Metazoa; Chor
Mammalia; Eutheria; Rode
                                                                                                                                                      the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mol. Cell.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        conversion
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gonzalez F.J., Song
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=87064606; PubMed=3785219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CYP3A2 OR CYP3A-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P05183; Q64672;
13-AUG-1987 (Rel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CP32_RAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID-10116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11
                                                                                                                                                                                                                           CATALYTIC ACTIVITY: RH + REDUCED FLAVOPROTEIN + OXIDIZED FLAVOPROTEIN + H(2)O.
SUBCELLULAR LOCATION: MEMBRANE-BOUND. ENDOPLASMI INDUCTION: BY PREGNENOLONE 16-ALPHA-CARBONITRILE
                                                                                                                                                                                                                                                                                  FUNCTION: CYTOCHROMES P450 ARE A GROUP OF HEME-THIOLATE MONOOXYGENASES. IN LIVER MICROSOMES, THIS ENZYME IS INVOLVED IN NADPH-DEPENDENT ELECTRON TRANSPORT PATHWAY. IT OXIDIZES A VARIET OF STRUCTURALLY UNRELATED COMPOUNDS, INCLUDING STEROIDS, FATTY ACIDS, AND XENOBIOTICS.
                                                                                                                                                                                                                SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 L-HRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGS
            M13646;
X79319;
X79320;
U09742;
U09734;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSFSTWGNNY-----MPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LIPRSPTDDMKIGGYDVPRDTIVMVNAWAIHRDPEIWEEPEKFNPDRY---NDGC----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANLLRNPEVLEKARSE-----IDEKIGKDRLIDESDIAVLPYLQNVVSETFRLFPVAPF
U09725;
                                                                                                                         non-profit institutions as long as its content and this statement is not removed. Usage by an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .J., Song B.-J., Hardwick J.P.; one 16 alpha-carbonitrile-inducible and differential regulation.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Biol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSDYYVYKLMPFGNGRRTCPGAGLGQRIVTLALGSLIQCFEWENVKGEE
                                     AAA41051.1;
CAA55887.1;
CAA55888.1;
            AAA82168.1;
AAB60492.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q64629;
                                                                                              s a license agreement (S to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6:2969-2976(1986).
                                                                                                                                                                                                                                                                                                                                                                                                                              WLEY; TISSUE-Liver; PubMed=7979376;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chordata;
Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Craniata; Ver
Sciurognathi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                            16-ALPHA-CARBONITRILE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    504
                                                                                                            (See http://www.isb-sib
                                                                                                                                                    There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Vertebrata;
thi; Muridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                        ENDOPLASMIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    P-450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (P450-PCN2) (P450/6
                                                                                                                                                                                                                                                                                                                                                                                    encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                     0(2) -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Euteleostomi;
; Murinae; Rat
                                                                                                                                                                                                                                                                                                                                                                                 e form of
ding CYP3A2:
                                                                                                                                                                                                                            (PNCN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (P450IIIA).";
                                                                                                                                                      restrictions
                                                                                                                                                                                                                                           RETICULUM
                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    family:
                                                                                                                                                                      a collaboration
                                                                                                                                                                                                                                                                      ROH
                                                                                                                                           ž
                                                                                                                            for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       492
                                                                                                             .ch/announce/
                                                                                                                                                                                                                                                                                                                VARIETY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rattus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         367
                                                                                                                                                       on
                                                                                                                                        no
                                                                                                                                        way
```

```
밁
                                                 D
                                                                       Ş
                                                                                                   В
                                                                                                                       Q
                                                                                                                                                  밁
                                                                                                                                                                         Š
                                                                                                                                                                                                   В
                                                                                                                                                                                                                        2
                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro; IPRO03128; -...
InterPro; IPRO02397; -...
InterPro; IPRO02401; -...
InterPro; IPRO02402; -...
InterPro; IPRO02403; -...
InterPro; IPRO02403; -...
Pfam; PF00067; p450; 1.
PRINTS; PR00385; P450.
PRINTS; PR00463; EP450II.
PRINTS; PR00464; EP450II.
PRINTS; PR00465; EP450IV.
PROSITE; PR00866; CYTOCHROP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL;
EMBL;
EMBL;
EMBL;
EMBL;
EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PIR; A25222; A25222.
HSSP; P14779; 1FAG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Microsome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Oxidoreductase; Monooxygenase;
436
                        455
                                                 385
                                                                          395
                                                                                                   330
                                                                                                                         335
                                                                                                                                                   278
                                                                                                                                                                          275
                                                                                                                                                                                                   229
                                                                                                                                                                                                                                                   169
                                                                                                                                                                                                                                                                                                  111
                                                                                                                                                                                                                                                                                                                           118
                                                                                                                                                                                                                           222
                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                    58
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity 25.5 nes 137; Conservative
                                                                                                                                                                                                                                                                                                                                                                           65
                                                                                                                                                                                                                                                                                                                                                                                                    w
                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; U09726; AAB60492.1;
; U09727; AAB60492.1;
; U09728; AAB60492.1;
; U09729; AAB60492.1;
; U09730; AAB60492.1;
                                                                 KGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMP 454
                                                                                                                                                  AH---NNSKDE-----VSHKALSDVEIIAQSVIFIFAGYETTSSTLSFVLYFLATHPDIQ
                                                                                                                                                                                                LTP---IYEMLNICMFPKDSIAFFQKFVHR-IKETRLDSKHKHR------VDFLQLMLN
                                                                                                                                                                                                                                                                                                  VGIMGKAVSVAKDEEWKRYRALLSPTFTS-GRLKE-MFPIIEQYGDILVKYLKQEAETGK
                                                                                                                                                                                                                                                                                                                                                                 GDFMQQHVSKYGKIYRSNLFGEPTIVSA--DAGLNRFILQNEGRLFEC----SYPRSIG-
                                                                                                                                                                                                                                                                                                                                                                                                LLPLLLLPSLLSLLLFLILLKR--RNRKTRFNLP--PGKSGWPFLGETIGYLKPYTATTL
FGNGPRNCIGMRFALMNMKLALTKVLQNFSFQPCKETQ--
                        FGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRVSR 511
                                                 DGLFIPKGSVVTIPTYALHHDPQHWPKPEEFHPERFSKENKGS
                                                                                                 KKLQEE-IDGALPSK----APPTYDIVMEMEYLDMVLNETLRLYPIGNRLERVCKKDIEL
                                                                                                                 EELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRY
                                                                                                                                                                         DHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLOACPKAV
                                                                                                                                                                                                                        NLPGTAYHKAL-----QSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKS
                                                                                                                                                                                                                                                  PVTMKKVFGAYSMDVITSTSFGVNVDSLNNPKDPFVEKTKKLLRFDFFDPLFLSVVLFPF
                                                                                                                                                                                                                                                                                                                                                   GREDMECYKKYGKIW--GLEDGQTPVFAIMDTEMIKNVL----VKECFSVFTNRRDFGP
                                                                                                                                                                                                                                                                          -----IFSA--QDEAKKFTFNLMAKHIMS-MDPGEEETEQLKK--EYVTFMKGVVSAPL
                                                                                                                                                                                                                                                                                                                          -GILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             U09731; AAB60492.1;
U09732; AAB60492.1;
U09733; AAB60492.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Endoplasmic reticulum.
443 443 HEME
56 57 GL -
429 429 D ->
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CYTOCHROME_P450;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              445 G
57731 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOINED.
JOINED.
JOINED.
JOINED.
JOINED.
JOINED.
JOINED.
JOINED.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HEME.

GL -> AV (IN CAAS
D -> H (IN REF.
G -> D (IN REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 312.5;
Pred. No. 5.2e
96; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C2C84AF736035AB2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Electron transport; Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (IN CAA55887).
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ); DB 1;
.2e-13;
.es 211;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
IPLKLSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            504;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   93;
                                                 -ΥΥΥΓΡ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Heme;
480
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                 435
                                                                                                 384
                                                                                                                                                329
                                                                                                                                                                         334
                                                                                                                                                                                                  277
                                                                                                                                                                                                                        274
                                                                                                                                                                                                                                                 228
                                                                                                                                                                                                                                                                          221
                                                                                                                                                                                                                                                                                                  168
                                                                                                                                                                                                                                                                                                                           172
                                                                                                                                                                                                                                                                                                                                                                                                   57
                                                                                                                                                                                                                                                                                                                                                                                                                          64
```

24;

RESULT

```
CCDJS_MOUSE
ID CPJS_MA
AC O54749
AC CFPCYCC
DT 01-OCT
DE EXPOXYG
GN CYP2J5
OS MUS MU
OC ENLARIN
RO MADLIN
RO IN THE FINTE
DR MGD; W
DR INTER
DR MGD; W
DR PFANTS
DR PFANTS
DR PFANTS
DR PFANTS
DR PRINTS
DR PROSIT
NW MICTOS
FT BINDIP
SO SEQUEN
                                                                                                                                                                                                                                          ġ
                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                               맑
                                                                                                                         밁
                                                                                                                                                             õ
                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                     Ş
  Ş
                                         밁
                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CPJ5_MOUSE
O54749;
15-DEC-1998
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROSITE; PS00086; CYTOCHROME_P450; 1.
Oxidoreductase; Monooxygenase; Electron transport;
Microsome; Endoplasmic reticulum.
BINDING 447 447 HEME (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mouse chromosome 4.";
Genomics 49:152-155(1998).
GENOMICS 49:152-175(1998).
GENOMICS 49:152-175(1998).
OXIDIZED FLAVOPROTEIN + H(2)O.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=C57BL/6 X CBA; TISSUE=Live
MEDLINE=98234557; PubMed=9570962;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15-DEC-1998 (Rel. 37, Last sequence update)
01-OCT-2000 (Rel. 40, Last annotation update)
01-OCT-2000 (Rel. 40, Last annotation update)
CONTROME P450 2J5 (EC 1.14.14.1) (CYPIIJ5) (ARACHIDONIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro; IPR002401; -. Pfam; PF00067; p450; 1. PRINTS; PR00385; P450. PRINTS; PR00463; EP450I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MGD; MGI:1270149; Cyp2j5.
InterPro; IPR001128; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -I- SUBCELLULAR LOCATION: MEMBRANE-BOUND. ENDOPLASMIC -I- SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Eukaryota; Metazoa; Chordata; Mammalia; Eutheria; Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EPOXYGENASE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ma J., Ramachandran S., Fiedorek F.T. Jr., :
"Mapping of the CYP2J cytochrome P450 genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=10090
                                           240
                                                                                 223
                                                                                                                         182
                                                                                                                                                                 180
                                                                                                                                                                                                                                              121
                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                    74
                                                                                                                                                                                                                                                                                                                            74
                                                                                                                                                                                                                                                                                                                                                                                                       14
                                                                                                                                                                                                                                                                                                                                                                 21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 musculus (Mouse)
QRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELRE
                                                                                                                                                                                                                                        GKWSMLVLVGDMHRDMRSISLNFLSHARL-RTILLKDVERHTLFVLDSWQQNSIFSAQDE
                                                                                                                                                                                                                                                                                                                     KYGKIYRSNLFGEPTIVSADAGL-------NRFILQNEGRLFECSYPRSIGGIL 120
                                                                                                                                                                                                                                                                                                                                                             LVLAVVTFLFLINILRSRHPK---NYPPGPWRLPFVGNFFQIDTKQTHLVL----QQFVK 73
                                                                                                                                                                                                                                                                                                                                                                                                     LLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVS 73
                                                                           LPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEA---EMSKSDHVRK
                                                                                                                       LK--LINAVSNIICSVTFGERFDYEDCQFQELLQLLDETMHLMGSSAGQLYNGFPCIMKY
                                                                                                                                                             AKKFTFNLMAKHIMSMDPGE------EETEQLKKEYVTFMKGVVSAPLN------
                                                                                                                                                                                                  GKNGLVVSNGQTWKEQRRLALMALRNFGLGKKSLEERIQEETHHLVEAIREEGGQPFNPH 181
                                                                                                                                                                                                                                                                                  KYGNVFSLELGQSPVVVVSGLPLIKEMFTHLDQNFVNRFMTPVRER---
                                       LPG-PHQKIFRNWGKLKLFVSHIVKKH-----EKDWNPDEPRDFIDAFLIEMQK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           U62294; AAB87635.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 501 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             57784 MW; C67F2E79DD64AF99 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11.6%;
23.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TISSUE-Liver;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                               96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 312; DB 1;
Pred. No. 5.5e-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Craniata; Vertebrata; Sciurognathi; Muridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FLAVOPROTEIN +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Zeldin D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 501;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               D.C.;
nan chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Euteleostomi;
; Murinae; Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RETICULUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACID
                                                                                                                                                                                                                                                                                                                                                                                                                                             92;
                                                                                                                                                                                                                                                                                  T
                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Н
                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                               17;
```

```
Š
                             Вр
                                                         δÃ
                                                                                        Дb
                                                                                                                  δÃ
                                                                                                                                                                                                                            YRV1_C/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                   Matches
                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YRV1_CAEEL
Q27513;
Q1-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAEEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-NOV-1997 (Rel.
01-NOV-1997 (Rel.
30-MAY-2000 (Rel.
                                                                                                                                                                                                                       PROSITE; PS00086; CYTOCHROME_P450; 1.
Hypothetical protein; Oxidoreductase; Monooxygenase; Heme BINDING 464 HEME (BY SIMILARITY).
SEQUENCE 520 AA; 59371 MW; 996C1172B8D64E93 CRC64;
                                                                                                                                                                                                                                                                                                             InterPro; IPR001128; -. InterPro; IPR002402; -. Pfam; PF00067; p450; 1.
                                                                                                                                                                                                                                                                                                                                                                         EMBL; Z48717; CAA88603.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                       or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                    use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eukaryota; Metazoa;
Rhabditidae; Pelode:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Caenorhabditis elegans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CYP13A4 OR T10B9.1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-NOV-1997 (Rel. 35, Last sequence update) 30-MAY-2000 (Rel. 39, Last annotation updat PUTATIVE CYTOCHROME P450 CYP13A4 (EC 1.14.-
                                                                                                                                                                                                                                                                   PRINTS; PR00464; EP450II.
PROSITE; PS00086; CYTOCHR
                                                                                                                                                                                                                                                                                                PRINTS; PR00385; P450
                                                                                                                                                                                                                                                                                                                                                           WormPep; T10B9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gardner A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      288
                               83
                                                         94
                                                                                                                     42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mitted (MAR-1995) to the EMBL/GenBank/DDBJ databases. FUNCTION: CYTCHROMES P450 ARE A GROUP OF HEME-THIOLATE MONOOXYGENASES. THEY OXIDIZE A VARIETY OF STRUCTURALLY UNREL COMPOUNDS, INCLUDING STEROIDS, FATTY ACIDS, AND XENOBIOTICS SIMILARITY: BELONGS TO THE CYTCCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                             European Bioinformatics Institute. There are no restrictions by non-profit institutions as long as its content is in
 RLRTIL---
                                                                                                            GKSGWPFLG-----ETIGYLKPYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SWISS-PROT entry is copyright. It is produced through a collaboration sen the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EIDRVIGHKRQVSLS-----DRESMPYTNAVIHEVQRMGNIVPLNSSREVTVDTKFNGFH 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---DPD-----RTTSFNEENLISTTLDLFLGGTETTSSTLRWALLYMSSYPEIQENVQA
                             P---EFVHEVFVKQFDNFYGRKTNPIQGDPNKNKRAHLVLAQGHRWKRLRTLASPTFSNK
                                                         AGLNRFILQNEGRLFECSYPRSIGGILG-----KWSMLVLV-GDMHRDMRSISLNFLSHA 147
                                                                                        GPRGFPFFGVILKFHDYENPGLLK------LGEW----TKKYGSIYGITEGVEKTLVVSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KRACLGEQLAKSELFIFFSALMQKFTFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRLCAGSELAKLEMAVFIHHLVLKFNWE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LPKGTMILTNLTALHRDPKEWATPEVFNPEHFLE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRF-LHRKALKDVRYKGYD 398
                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Peloderinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
 -LKDVERH--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 35, Created)
. 35, Last sequ
. 39, Last anno
                                                                                                                                                                                                                                                                                                                                                           CE01654.
                                                                                                                                                                                                                                                                                                                                                                                                                     license agreement (See http://www.isb-sib.ch/announce,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Nematoda;
                                                                                                                                                               11.6%;
                                                                                                                                                 102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             oda; Chromadorea; Caenorhabditis.
                                                                                                                                                              Score 310.5;
Pred. No. 7.
----TLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHI 192
                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (EC 1.14.-.-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A
                                                                                                                                                              2e-13;
                                                                                                                                                                            DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rhabditida; Rhabditoidea;
                                                                                                                                                177;
                                                                                                                                                                                                                                                                                                                                                                                                                                    Usage
                                                                                                                                                                          Length
                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                    ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            UNRELATED
                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                              Gaps
                                                                                        82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  443
                                                                                                                    93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                23;
```

Gaps

21;

62

171

```
CCC -1- SU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       , 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                MGD; MGI:1270148; Cyp2j6.
InterPro; IPR001128; -.
InterPro; IPR002401; -.
Pfam; PF00067; P450; 1.
PRINTS; PR00388; P450.
PRINTS; PR00463; EP4501.
PROSITE; PS00086; CYTOCHROME_P450; 1
                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EW the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content modified and this statement is not removed. Usage by and entities requires a license agreement (See http://www.isb-sentities.
                                                                                                                                                                                                                                                                                                                                                                                                                                           15-DEC-1998 (Rel. 37, Created)
15-DEC-1998 (Rel. 37, Last sequence update)
01-CCT-2000 (Rel. 40, Last annotation update)
CYTOCHROME P450 2J6 (EC 1.14.14.1) (CYPIIJ6) (ARACHIDONIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-C57BL/6 X CBA; TISSUE-Liver; MEDLINE-98234557; PubMed-9570962; Ma J., Ramachandran S., Fiedorek F.T. Ma J., Ramachandran S., Fiedorek F.T. Mapping of the CYP2J cytochrome P450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Metazoa;
Mammalia; Eutheria;
NCBI_TaxID=10090;
    Microsome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A. STRAIN-C57BL/6 X C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CPJ6_MOUSE
                     Oxidoreductase;
                                                                                                                                                                                                                                  or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mus musculus (Mouse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EPOXYGENASE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                    SUBCELLULAR LOCATION: MEMBRANE-BOUND. ENDOPLASMIC RETICULUM. SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SLRKIMSTVEETVVELMRHLDEASAKGKAVDLLDYYQE------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RICIGMRLAMMEEKLLLTHILKKYTFDTSTETE 494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQ 492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EGTNVQVDTWTLHYDPKVWGDDASEFKPERWE-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SGWKVLPVISAVHLDNSRY-DQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----VDRECPDPEVTEDQISKLKYMECVVKEALRMYPLASLVHNRKCMKKTNVLGVEID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLH-RKALKDVRYKGYDIP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LGFAKSEVLKVDKHLTFDEIIGQLFVFLLAGYDTTALSLSYSSYLLATHPEIQKKLQEE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LGW----VLK-HSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GIMNTMEKALNKRLEQRAADKKAGIEPSGEPQDFIDLFLDARANV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QSRATILKFIERKMEERKLDIKE-----EDQEEEEVKTEDEAEMSKSDHVRKQRTDDDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            M----GQTESLMFRNPMLPKVKEIFKKGGKMPFLIAGVFPIAGTLMRQLFMKFPKFSPAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MSMDPGEEET ----EQLKKEYVTFMKG----VVSAPLNLPGT---
                                                                                                                                                                                       U62295; AAB87636.1; -.
  Endoplasmic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                   Monooxygenase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Chordata;
Rodentia;
    reticulum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Craniata; Vertebrata; Euteleostomi; Sciurognathi; Muridae; Murinae; Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                     Electron
                                                                                                                                                                                                                                                                                                                                                                                                                                                               FLAVOPROTEIN + O(2) =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Jr., i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    501
                                                                                                                                                                                                                                                      (See http://www.isb-sib.ch/announce/
                   transport; Membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Zeldin D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TGDELFYAKG-GYLPFGMGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -DFIEEEST----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                chromosome
                                                                                                                                                                                                                                                                                                                 restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----AYHKAL 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -FTLDIIGRIA 187
                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                         EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACID
                                                                                                                                                                                                                                                                                               ıs
                                                                                                                                                                                                                                                                                                                                           a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ROH
                                                                                                                                                                                                                                                                          for
                     Heme;
                                                                                                                                                                                                                                                                                                                                         outstation
                                                                                                                                                                                                                                                                              commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            243
                                                                                                                                                                                                                                                                                                                 o
B
                                                                                                                                                                                                                                                                                               no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SQ
RRATA RRANGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                        P244-74;
P244-74;
P244-74;
P1-MAR-1992 (Rel. 21, Created)
P1-MAR-1992 (Rel. 21, Last sequence update)
P1-DEC-1998 (Rel. 37, Last annotation update)
P1-DEC-1998 (Rel. 37, Last annotation update)
P1-DEC-1998 (Rel. 37, Last annotation update)
P1-MAR-1992 (Rel. 21, Last annotation update)
                 Arch. Biochem. [2]
                                                          MEDLINE-91112759; PubMed-2275554;
Lai T.S., Chiang J.Y.L.;
Tolaing and characterization of two major 3-methylcholanthrene inducible hamster liver cytochrome P450s.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BINDING
SEQUENCE FROM
                                                                                                                                               TISSUE-Liver;
                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                      Mammalia;
                                                                                                                                                                                                                                                                       Eukaryota;
                                                                                                                                                                                                                                                                                               Mesocricetus auratus (Golden hamster).
                                                                                                                                                                                                                                                                                                                                                                                                                                             CPA8_MESAU
                                                                                                                                                                                                          NCBI_TaxID=10036;
                                                                                                                                                                                                                                  Mesocricetus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9 LLPLLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFM 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GLTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GLPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLK--FNWELAEDDQPFAFPFVDFPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MALYPEVQEKVQAEIDRVIGQKR-----AARLADRESMPYTNAVIHEVRRMGNIIPLNVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QPHLSIQPLVKKYGNIFSLNLGDITSVVITGLPLIKEALTQMEQNIMNR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LHPRTLLVAAVTELLLADYFKNRPK---NYPPGPWGLPFVGNIFQL------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KK-RESFLPFSMGKRACLGEQLARSELFIFFTSLMQKFTFNPPINEKLSP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REVAMDININGFHLPKGTMVLTNLTALHRDPKEWATPDVFNPEHFLE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRF-LH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FLKEMTK-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SQLYNIFPWIMKYIPG-SHQKVFRNWEKLKLFVSCMIDDHR-----KDWNPDEPRDFIDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SAPLN------LPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIFSAQDEAKKFT----FNLMAKHIMSMDPGE-----EETEQLKKEYVTFMKGVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SVMQERISNKNGLIFSSGQIWKEQRRFALMTLRNFGLGKKSLEERMQEEASHLVEAIR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SI--GGILGKWSMLVLVGDMHRDMRSISLNFLSHARL-RTILLKDVERHTLFVLDSWQQN 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QQHVS-----KYGKIYRSNL------FGEPTIVSADAGLNRFILQNEGRLFECSYPR 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----EEEGKPFNPHFSINNAVSNIICSVTFGERFDYHDSRFQEMLRLLDEVMYLETTMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFF
                                                                                                                                                                                                                                                      Eutheria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          447
501 AA;
                                                                                                                                                                                                                                                                          Metazoa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
N.A.
                                         Biophys.
                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             447 I
                                                                                                                                                                                                                                                    Chordata;
Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11.3%; 23.2%;
                                       cytochrome P450s. 283:429-439(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -YPEKTTSFNEENLICSTLDLFFAGTETTSTTLRWALLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 303; DB 1;
Pred. No. 2.1e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HEME (BY SIMILARITY).
4E5A26B35D831E37 CRC64;
                                                                                                                                                                                                                                                  Craniata; Vertebrata; Euteleostomi; Sciurognathi; Muridae; Cricetinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                ion update)
(CYPIIA8) (P450-MC1) (P450-AFB).
                                                                                                                                                                                                                                                                                                                                                                                                                                             494
                                                                                                                                                                                                                                                                                                                                                                                                                                             Å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 501;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels 116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jd--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -- DFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGQF
```

503

431 445 380 385 325 326 280 269 226 217

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro; IPR001128; -.
InterPro; IPR002401; -.
Pfam; PF00067; P450; 1.
PRINTS; PR00385; P450.
PRINTS; PR00463; EP4501.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BINDING
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Fukuhara M., Nagata K., Mizokami K., Yamazoe Y., Takanaka A., Kato R., "Complete cDNA sequence of a major 3-methylcholanthrene-inducible cytochrome P-450 isozyme (P-450AFB) of Syrian hamsters with high
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TISSUE=Liver;
MEDLINE=89322253; PubMed=2502109;
Fukuhara M., Nagata K., Mizokami
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; M63788; AAA37068.1; -.
EMBL; M27906; AAA37084.1; -.
PIR; A33293; A33293.
PIR; S13884; S13884.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             activity toward aflatoxin B1.";
Biochem. Biophys. Res. Commun. 7-ETHOXYCOUMARIN O-DEETHYLATION, AND
-1- FUNCTION: HIGHLY ACTIVE IN 7-ETHOXYCOUMARIN O-DEETHYLATION, AND
BENZPHETAMINE N-DEMETHYLATION; MODERATELY ACTIVE IN TESTOSTERONE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROSITE; PS00086; CYTOCHROME_P4
Oxidoreductase; Monooxygenase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Microsome; Endoplasmic reticulum
                                                                                                                                                                                                                                                                                                                              121
     290
                                                        281
                                                                                                          233
                                                                                                                                                                226
                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                        172
                                                                                                                                                                                                                                                                                                                                                                             130
                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12 LILLPSILSILLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7-ALPHA-HYDROXYLATION, ETHYLMORPHINE N-DEMETHYLATION, P-
NITROANISOLE O-DEMETHYLATION; AND ONLY SLIGHTLY ACTIVE IN
BENZOPYRENE 3-HYDROXYLATION, 7-ETHOXYRESORUFIN O-DEETHYLATION,
TESTOSTERONE 2-ALPHA-HYDROXYLATION AND TESTOSTERONE 17-OXIDATION.
COMPETENT IN THE METABOLIC ACTIVATION OF AFLATOXIN B1.
CATALYTIC ACTIVITY: RH + REDUCED FLAVOPROTEIN + O(2) - ROH +
OXIDIZED FLAVOPROTEIN + H(2)O.
SUBCELLULAR LOCATION. HEMBRANE-BOUND. ENDOPLASMIC RETICULUM.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INDUCTION: BY 3-METHYLCHOLANTHRENE (3MC). SIMILARITY: BELONGS TO THE CYTOCHROME P450 FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VSKYGKIYRSNLFGEPTIV--SADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLV 129
                                                                                                                                                                                                                                                                                                                        GERAKQLRRFSIATLRDFGFGKRGIEERTIEETSFLIQALRDTNGATIDPTFYMSRTVSN
                                                                                                                                                                                                                                                                                                                                                                                                                                   RERYGPVFTIHLGPRPAVMLWGYDAVKEALIDQAE-ELSDRGEQAFFDWFFKGYGVVFSS 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MLLVVVLTCLSVMIIMSVWRQRRLLRKMPPGPTPLPFIGNFL----ELDTEKFYDCLSKM 61
                                                  RTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREE
                                                                                                                                                             TAYHKALQSRATILKFIERKMEE--RKLDIKEEDQ--EEEEVKTEDEAEMSKSD-HVRKQ
                                                                                                                                                                                                                VISSIVEGNREEYDDKEF-LSLLGMIMRSEQEMSTSTGQLFEMFYSVMK------HLPG
                                                                                                                                                                                                                                                  SIFSA-----QDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPG
                                                                                                                                                                                                                                                                                                                                                                             GDMHRDMRSISLNFLSH-----ARLRTI------LLKDVERHTL---FVLDSWQQN
                                                                                                          -- CQHQAYKEMQGLEDFIARKVEENQRTLDPNSPRDFIDSFLIRMQEEKKNPRTQFHMR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SPECIFICITY: LIVER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     494 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CYTOCHROME_P450; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  439 HEME (BY SIMILARITY).
417 S -> L (IN REF. 2).
57387 MW; 16816672AA4B112B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11.3%;
24.2%;
- NLLMTTLNLFFAGTETVSTTTRYGFLLLMKYPHIAAKMHEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 302; DB 1;
Pred. No. 2.4e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Electron transport; Membrane; Heme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    There are no restrictions ong as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   228;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 494;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                bγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                commercial
                                                     340
                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                             171
                                                                                                                                                             280
                                                                                                                                                                                                                   232
                                                                                                                                                                                                                                                                  225
                                                                                                        289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20;
```

SOTTEN REPRESENTATION OF THE STREET REPRESENT

04 07 07 08 09 09

24 DP 04

```
Q
                                                               Вþ
                                                                                        Qy
                                                                                                                             DЬ
                                                                                                                                                          QY
 밁
 436
                                 459
                                                                 385
                                                                                               399
                                                                                                                               331
                                                                                                                                                               341
                                                                                                                                                            HLEIARAKKELGES-ELNWDDYKKMDFTQCVINETLRLGNVVRF-LHRKALKDVRYKGYD 398
                                                                                                                            IDQV-----IGRNRQPKYEDHLKMPYTEAVIYEIQRFVDVVPLGLPRSTTKDIKFRDFL
KRYCFGESLAKMELFIFFTTIMQNFCFKSPQAPQDIDVTPQYFSFAAIP
                               PRICAGSELAKLEMAVFIHHLVLKFNWELAE-----DDQPFAFPFVDFP
                                                                                   IPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGG 458
                                                              IPKGTDVFPVLSSVLKDPKFFSNPNDFNPQHF---
                                                               ----SDDKGQFKK-SNAFMPFSVG
   484
                               502
                                                                                                                             384
```

Search completed: September 28, 2001, 18:45:59 Job time: 124 sec

	· .		٠.	
· ·				
·				
				·
		·		
	·			

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on:
       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
  978.7

978.6

860

860

860

861

5761.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

579.5

57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              seg length: 0
seg length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4321
    BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIR_68:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-502-426-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              September 28, 2001, 18:43:30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  219241 seqs, 76174552 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 pir1:*
pir2:*
pir3:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MFETEHHTLLPLLLLPSLLS......FAFPFVDFPNGLPIRVSRIL 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
  DB
$55379
H96759
H96759
D85429
T04444
T07859
T071479
R86859
R84733
B84733
B84733
T026263
T04602
$7574602
$7574777
$74778
$754778
$754778
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$754777
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$75477
$7547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; Search time 19.47 Seconds (without alignments) 2007.064 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        219241
                                                                                                                                                                                                                                                                                                                                                                                                                    hypothetical prote cytochrome P450 ho cytochrome P450 - probable cytochrom cytochrome P450 dl probable cytochrom hypothetical prote
                 hypothetical prote
hypothetical prote
hypothetical prote
cytochrome P450 ho
hypothetical prote
cytochrome P450 mo
cytochrome P450 3A
cytochrome P450 2B
                                                                                                                                                                                                                                                                               probable cytochrom
hypothetical prote
cytochrome P450 DW
cytochrome P450 -
cytochrome P450 -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  steroid 22-alpha-h
cytochrome P450 CY
probable steroid 2
                                                                                                                                                                                                        hypothetical prote
hypothetical prote
cytochrome P450 hy
                                                                                                                                                                                                                                                                                                                                                                                                  hypothetical prote cytochrome P450-li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          probable steroid 2 cytochrome P450 li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Description
```

оу оу ор

181 181 241 241 301

ILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDD

300 300

cytochrome P450 2B testosterone 16alp cytochrome P450 2A cytochrome P450 2A cytochrome P450 2B probable Cytochrome flavonoid 3',5'-hy cytochrome P450 2B Lanosterol 14alpha cytochrome P450 3A cytochrome P450 76 cytochrome P
--

491 DQPFAFPFVDFPNGLPIRVSR 511

```
RESULT 2
$55379
$55379
Cytochrome P450 CYP90 - Arabidopsis thallana
N;Contains: oxidoreductase (EC 1.-.-)
C;Species; Arabidopsis thallana (mouse-ear cress)
C;Species; Arabidopsis thallana (mouse-ear cress)
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 21-Jul-2000
C;Accession: $55379
R;Szekeres, M.; Nemeth, K.; Koncz, Z.; Nagy, F.; Koncz, C.
submitted to the EMBL Data Library, May 1995
A;Refterence number: $55379
A;Refterence number: $55379
A;Molecule type: mRNA
A;Residues: 1-472 <SZE>
A;Cross-references: EMBL:X87367; NID:g853718; PIDN:CAA60793.1; PID:g853719
C;Genetics:
A;Genetics:
A;Genetics:
A;Genetics:
C;Superfamily: Synechocystis cytochrome P450 slr0574; cytochrome P450 homology
C;Keywords: chromoprotein; electron transfer; heme; iron; metalloprotein; monoc
F;275-440/Domain: Cytochrome P450 homology <P455
F;418/Binding site: heme iron (Cys) (axial ligand) #status predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Б
                                                                                       В
                                                                                                                             QΥ
                                                                                                                                                                                  В
                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
8
                                     Q
                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                       δ, B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Superfamily: Synechocystis cytochrome P450 slr0574; cytochrome P450 homology (Reywords: chromoprotein; electron transfer; heme; iron; metalloprotein; monooxygenase; 275-440/Domain: cytochrome P450 homology CP45> (axial ligand) #status predicted
  397
                                                                                          337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                    279
                                                                                                                                                                                                                                                                            233
                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                           124
                                                                                                                                                                                                                                                                                                                       252
                                                                                                                                                                                                                                                                                                                                                                                                              192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12 LLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
les 210; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFA 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                         LHKRMHSLTMSFANSSIIKDHLMLDIDRLVRFNLDSWSSRVLL--MEEAKKITFELTVKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VSKYGKIYRSNLEGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LKFNWELAEDDQPFAFPFVDFPNGLPIRVSRIL 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYD 420
                                          QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED 490
                                                                                       NETLRVANIIGGVFRRAMTDVEIKGYKIPKGWKVFSSFRAVHLDPNHFKDARTFNPWRWQ
                                                                                                                                  NETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQ 431
                                                                                                                                                                                    GYETTSTIMTLAVKFLTETPLALAQLKEEHEKIRAMKSD--SYSLEWSDYKSMPFTQCVV
                                                                                                                                                                                                                               GHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVI 371
                                                                                                                                                                                                                                                                         VVVMKRREEEEEGAE-------RKKDMLAALLAADDGFSDEEIVDFLVALLVA
                                                                                                                                                                                                                                                                                                                                                                    LMSFDPG-EWSESLRKEYLLVIEGFFSLPLPLFSTTYRKAIQAR-----RKVAEALT 232
                                                                                                                                                                                                                                                                                                                                                                                                            IMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKL 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARYGSVFMTHLFGEPTIFSADPETNRFVLQNEGKLFECSYPASICNLLGKHSLLLMKGS 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LLLLSSIAAGFL---LLLRRTRYRRMGLPPGSLGLPLIGETFQLIGAYKTENPEPFIDER 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LKFNWELAEDDKPFAFPFVDFPNGLPIRVSRIL 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
SNSVTTGPSNVFTPFGGGPRLCPGYELARVALSVFLHRLVTGFSWVPAEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 36.5%; Score 978.5; DB 1;
41.9%; Pred. No. 5.9e-56;
ative 79; Mismatches 171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 472;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   41;
  446
                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                    336
                                                                                                                                                                                                                                                                            278
                                                                                          396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                       밁
```

```
R.Theologis, A.; Ecker, J.R.; Palm, C.J.; Federspiel, N.A.; Kaul, S.; White, O.; Alon Chin, C.W.; Chung, M.K.; Conn, L.; Conway, A.B.; Conway, A.R.; Creasy, T.H.; Dewar, ansen, N.F.; Hughes, B.; Hulzar, L. Nature 408, 816-820, 2000

A; Authors: Hunter, J.L.; Jenkins, J.; Johnson-Hopson, C.; Khan, S.; Khaykin, E.; Kim, C.A.; Li, J.H.; Li, Y.; Liu, S.X.; Liu, S.X.; Liu, Z.A.; Luros, J.S.; Maiti, R.; Marzia Rizzo, M.; Rooney, T.; Rowley, D.; Sakano, H.

Rizzo, M.; Rooney, T.; Rowley, D.; Sakano, H.

A; Authors: Salzberg, S.L.; Schwartz, J.R.; Shinn, P.; Southwick, A.M.; Sun, H.; Tallo ker, M.; Wu, D.; Yu, G.; Fraser, C.M.; Venter, J.C.; Davis, R.W.

A; Title: Sequence and analysis of chromosome 1 of the plant Arabidopsis.

A; Reference number: A86141; MUID:21016719

A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-512 <STO>
A; Cross-references: GB:AE005173; NID:g11120803; PIDN:AAG30983.1; GSPDB:GN00141
A; Map position: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      probable steroid 22-alpha-hydroxylase T9L24.44 [imported] - Arabidopsis thaliana (c)Species: Arabidopsis thaliana (mouse-ear cress) C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 02-Mar-2001 #sequence_revision 02-Mar-2001 #text_change 31-Mar-2001 C;Accession: H96759
                                                                                                                                    Qy
                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                               Вр
                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                       δÃ
                                                                                            В
                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
450
                                            457
                                                                                            400
                                                                                                                                        402
                                                                                                                                                                                     347
                                                                                                                                                                                                                                   342
                                                                                                                                                                                                                                                                                 287
                                                                                                                                                                                                                                                                                                                             282
                                                                                                                                                                                                                                                                                                                                                                            250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             102
                                                                                                                                                                                                                                                                                                                                                                                                                        222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11
                                                                                                                                                                                                                                                                                                     QNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LLSVSSSTTFLAFIIIFLLAGIARRKRRAPHRLPPGSRGWPLIGDTFAWLNAVAGSHPSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LLLLPSLLSLLLFLIL-----LKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGD
GGTRFCPGAELARLQIALFLHYFITTYKWTQLKEDRISFFPSARLVNGFKIQLNR
                                         GGPRLCAGSELAKLEMAVFIHHLYLKFNWELAEDDQPFAFPFVDFPNGLPIRVSR 511
                                                                                          GCFVVPFLSAVHLDESYYKESLSFNPWRWLDPETQQKRNWRTSP-----FYCPFG
                                                                                                                                    GWKVLPVISAVHLDNSRYDQPNLFNPWRW-----QQQNNGASSSGSGSFSTWGNNYMPFG
                                                                                                                                                                                                                              LEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPS
                                                                                                                                                                                                                                                                                 AGNGVLGRLLEEESLPNESMADFIINLLFAGNETTSKTMLFAVYFLTHCPKAMTQLLEEH
                                                                                                                                                                                                                                                                                                                                                                            DLPGFTYNKAMKARKEIIRKINKTIEKRLQNKAASD-----T
                                                                                                                                                                                                                                                                                                                                                                                                                   NLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LQTLSNFKDGEVVLLQDICRKVAIHLMVNQLLGVS-SESEVDEMSQLFSDFVDGCLSVPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QNEGKLFQSSYPKSFRDLVGKDGVITVHGDQQRRLHSIASSMMRHDQLKTHFLEVIPVVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FMQQHVSK-----------YGKIYRSNLFGEPTIVSADAGLNRFIL 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FVEKQIKKFVSLLCSVLLLILKRPDNSGFNEIRYGRIFSCSLFGKWAVVSADPDFNRFIM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DKLVFFPTTRTQKRYPIFVKR
                                                                                                                                                                                     -----DRLAGGMLTWQDYKTMDFTQCVIDETLRLGGIAIWLMREAKEDVSYQDYVIPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative 105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    32.3%; Score 866; DB 2; 33.8%; Pred. No. 1.2e-48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                76;
504
                                                                                                                                                                                                                                   401
                                                                                                                                                                                                                                                                                                                           341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           130
                                                                                                                                        456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    66
                                                                                                                                                                                       399
                                                                                                                                                                                                                                                                                                                                                                            286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7;
```

```
C;Superfamily: symeomorphic of C;Keywords: heme; iron; metalloprotein C;Keywords: heme; iron; metalloprotein F;396/Binding site: heme iron (Cys) (axial ligand) #status predicted
                                           hypothetical protein F18022.190 - Arabidops C; Species: Arabidopsis thaliana (mouse-ear C; Date: 20-Apr-2000 #sequence_revision 20-P C; Accession: T48613 R; Bevan, M.; Murphy, G.; Ridley, P.; Hudson
                                                                                                                                                                                                                                                                                                                                     ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Map position: 4
C; Superfamily: Synechocystis cytochrome P450 slr0574;
C; Keywords: heme; iron; metalloprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C; Genetics:
A; Gene: AT4g36380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R;anonymous, The European Union Arabidopsis Genome Sequencing Consortium, The Cold Nature 402, 769-777, 1999
A;Title: Sequence and analysis of chromosome 4 of the plant Arabidopsis thaliana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cytochrome P450 like protein [imported] - Arabidopsis thaliana C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change C;Accession: D85429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT
D85429
K;Bevan, M.; Murphy, G.; Ridley, P.; Hudson, S.; submitted to the Protein Sequence Database, April A;Reference number: 224493
                                                                                                                                              RESULT
T48613
                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA
A; Residues: 1-457 <STO>
                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Cross-references:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Reference number: A85001; A; Accession: D85429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                       330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          116
                                                                                                                                                                                                                              440
                                                                                                                                                                                                                                                                 507
                                                                                                                                                                                                                                                                                                        386
                                                                                                                                                                                                                                                                                                                                               447
                                                                                                                                                                                                                                                                                                                                                                                                                            387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                  ഗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHR 386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTF 212
                                                                                                                                                                                                                            IRVATV 445
                                                                                                                                                                                                                                                                   IRVSRI 512
                                                                                                                                                                                                                                                                                                        ----FTPFGGGQRLCPGLELSKLEISIFLHHLVTRYSW-TAEEDEIVSFPTVKMKRRLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFF 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKT-----E 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DAEVNKVVLQNHGNTFVPAYPKSITELLGENSILSINGPHQKRLHTLIGAFLRSPHLKDR 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTI 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LPPGKSGWPFLGETIGYL-----KPYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSA 92
                                                                                                                                                                                                                                                                                                                                             TWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLP 506
                                                                                                                                                                                                                                                                                                                                                                                  KALKDVEIKGYLIPKGWCVLASFISVHMDEDIYDNPYQFDPWRWDRINGSANSSIC----
                                                                                                                                                                                                                                                                                                                                                                                                                      KALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                               LSDNPVALAKLVEENMEMKRRKLELGE-EYKWTDYMSLSFTQNVINETLRMANIINGVWR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IKGLICIPIKFPGTRLYKSLKAKERLIKMVKKVVEERQVAMTTTSPANDVVDVLLRDGGD 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ITRDIEASVVLTLASWAQLPLVHVQDEIKKMTFEILVKVLMSTSPG-EDMNILKLEFEEF 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IPNGSLGWPVIGETLNFIACGYSSRPVT-----FMDKRKSLYGKVFKTNIIGTPIIIST 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GB:NC_001268; NID:g7270586; PIDN:CAB80304.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               32.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MUID:20083488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             93;
                                                                                                                         Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 860; DB 2;
Pred. No. 2.6e-48;
3; Mismatches 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  chromosome 4 of the plant Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16-Feb-2001 #text_change 02-Apr-2001
                                                                                  20-Apr-2000 #text_change 20-Apr-2000
                        S.; Bancroft,
April 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                               I.; Mewes, H.W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSPDB:GN00140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       homology
                                                                                                                                                                                                                                                                                                                                                                                                                          446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               270
                                               Rudd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                               .
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sprin
                                               Ĕ
```

```
A; Accession: T48613
A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-382 <BEV>
A; Cross-references: EMBL
A;Gene: dwarf
C;Superfamily: Synechocystis cytochrome P450 slr0574;
F;273-436/Domain: cytochrome P450 homology <P45>
                                                                                                                                               Plant Cell 8, 959-969, 1996
A; Title: The tomato Dwarf gene isolated by A; Reference number: Z16181; MUID:96266705
A; Accession: T07859
                                                                                                                                                                                                              cytochrome P450 homolog - tomato C;Species: Lycopersicon esculentum (tomato) C;Date: 14-May-1999 #sequence_revision 14-May-1999 C;Accession: T07859
R;Bishop, G.J.; Harrison, K.; Jones, J.D.
                                                                                                                                                                                                                                                                                               RESULT
                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Experimental source: cultivar Columbia; BAC clone C; Genetics:
                                                      C; Genetics:
                                                                   A; Cross-references: EMI
A; Experimental source:
                                                                                                   A; Molecule type: mRNA
A; Residues: 1-464 <BIS>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Introns: 31/2; 1
A; Note: F18022.190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Map position: 5
                                                                                                                                  A; Status: preliminary;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                 330
                                                                                                                                                                                                                                                                                                                                                                                               465
                                                                                                                                                                                                                                                                                                                                                                                                                                                               405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           105
                                                                                                                                                                                                                                                                                                                                                                                                                               289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GWPFLGETIGYLKPYTATTLGDEMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNE 104
                                                                                                                                                                                                                                                                                                                                                                              SELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRV 509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWK 404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LKSWKNCREVEFHKEVKIFTLSVMVNQLLSIKPEDPARLYVLQDFLSYMKGFISLPIPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GKLFTSDYPKAMHDILGKYSLLLATGEIHRKLKNVIISFINLTKSKPDFLHCAENLSISI 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLEV 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GWPFIGETISFFKPHRSDSIGTFLQQRVSRYGKVFKSNICGGKAVVSCDQELNMFILQNE
                                                                                                                                                                                                                                                                                                                                                                 GELGKLQIAFFLHHLVLSYRWKIKSDEMPIAHPYVEFKRGMLLEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                  VLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTGYTNAIKVRSNRNIHQNAIIEDMNNAIREEDFLDSIISNED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLP
                                                                                                                                                                                                                                                                                                                                                                                                                               VFPIFTAVHLDPSLHENPFEFNPMRWTKTT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -RAKKGDGEL-LNWEDYQKMEFTQCVISEALRCGNIVKTVHRKATHDIKFNEYVIPKGWK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          159;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       139/3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL: DB
                                                                     EMBL:U54770; NID:g1421740;
be: strain GCR758
                                                                                                                                   translated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       204/1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       224/3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; Score 815; DB 2;
; Pred. No. 1.7e-45;
87; Mismatches 127
                                                                                                                                   from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         253/3;
                                                                                                                                   GB/EMBL/DDBJ
                                                                                                                                                                                   heterologous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       280/1;
                                                                                    PIDN: AAB17070.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          127;
                                                                                                                                                                                                                                                 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                              -----AFGGGVRVCPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          F18022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         315/3; 349/2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                     cytochrome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                 374
                                                                                                                                                                                   transposon
                                                                                    PID:g1421741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          92;
                                                                                                                                                                                                                                                 16-Feb-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EEHAAI 230
                       P450
                                                                                                                                                                                 tagging
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                     homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                              464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           224
                                                                                                                                                                                   encodes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4;
```

Query Match Best Local Similarity

28.4%;

Score Pred.

761 No.

.5; DB 2; 6.2e-42;

Length

464;

12;

```
Cytochrome P450 - Arabidopsis thaliana
Cytochrome P450 - Arabidopsis thaliana
Cytochrome P450 - Arabidopsis thaliana
N:Alternate names: protein T18B16.200; protein T5K18.10
N:Contains: oxidoreductase (EC 1. - . - . )
C:Species: Arabidopsis thaliana (mouse-ear cress)
C:Date: 30-Apr-1999 #sequence_revision 30-Apr-1999 #text_change 28-Jul-2000
C:Accession: T04444; T05806
C:Accession: T04444; T05806
R:Bevan, M: Benes, V: Rechmann, S: Borkova, D: Ansorge, W: Bancroft, I: Me
submitted to the Protein Sequence Database, April 1998
A;Accession: T04444
A;Accession: T04444
A;Accession: T04444
A;Accession: T04444
A;Accession: T04545
A;Cross-references: EMBL:AL021687
A;Cross-references: Cultivar Columbia; BAC clone T18B16
A;Molecule type: DNA
A;Accession: T05806
A;Cross-references: EMBL:AL022580
A;Cross-references: EMBL:AL022580
A;Cross-references: Cultivar Columbia; BAC clone T5K18
C;Genetics:
A;Anap position: 4
A;Introns: 67/2; 173/3; 302/3; 358/1; 393/3
A;Introns: 67/2; 173/3; 302/3; 358/1; 393/3
A;Note: T18B16.200; T5K18.10
C;Superfamily: Synechocystis cytochrome P450 slr0574; cytochrome P450 homology
C;Keywords: chromoprotein; electron transfer; heme; iron; monooxygenase; oxidore
F;272-433/Domain: cytochrome P450 homology <P45>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     딿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                           Superfamily: Synechocystis cytochrome P450 slr0574; cytochrome P450 homology Keywords: chromoprotein; electron transfer; heme; iron; monooxygenase; oxido 272-433/Domain: cytochrome P450 homology <P45>
  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KYRWEEIGGDKLMKFPRVEAPNGLRIRVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KFNWELAEDDQPFAFPFVDFPNGLPIRVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PYSFNPWRWMDKS------LEHQNSFLVFGGGTRQCPGKELGVAEISTFLHYFVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVL 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RSMRFTRAVILETSRLATIVNGVLRKTTQDMEINGYIIPKGWRIYVYTRELNYDPRLYPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IDLIITILYSGYETVSTTSMMAVKYLHDHPKVLEELRKEHMAIREKKKP--EDPIDYNDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHS----NLSTEQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LKQI----AGIESTSLAQEFMSEFFNLVLGTLSLPINLPNTNYHRGFQARKIIVNLLRTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AKHIMSMDPGEEET----EQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERK 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGSAHKYMRGALLSLISPTMIRDQLLPKIDEFMRSHLTNW-DNKVIDIQEKTNKMAFLSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KNQRARYGSFFKSHILGCPTIVSMDSELNRYILVNEAKGLVPGYPQSMIDILGKCNIAAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVL 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LIFLSSFFGLCIFCTALLRWNQVKYNQKNLPPGTMGWPLFGETTEFLK-----LGPSFM 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LLLLPSLLSLLLFLILLKRRN--RKTRFNLPPGKSGWPFLGETIGYLKPYTATTLG-DFM 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
     . 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S.; Borkova, D.; Ansorge, W.; Bancroft, I.; Database, April 1998
  Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----ASKEIQHDMLGYLMNEEATRFKLTDDEM
     632;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               510
     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           188;
     2
Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                   monooxygenase; oxidoreductase
                                                                                                                                                                                                                                                                                                                                                                                                                                                  J.; Volckaert,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mewes,
                                                                                                                                                                                                                                                                                                                                                                                                                                                  ດ
: ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ва
                                                                                                                                                                                                                                                                                                                                                                                                    probable cytochrome P450 At2g29090 [imported] - Arabidopsis thaliana
N;Alternate names: cytochrome P450 homolog T9I4.17
C;Species: Arabidopsis thaliana (mouse-ear cress)
C;Date: 24-Mar-1999 #sequence_revision 24-Mar-1999 #text_change 16-Feb-2001
C;Accession: T02739; D84692
C;Bate: 24-Mar-1999 #sequence_revision 24-Mar-1999 #text_change 16-Feb-2001
C;Accession: T02739; D84692
R;Rounsley, S.D.; Lin, X.; Kaul, S.; Shea, T.P.; Fujii, C.Y.; Mason, T.M.; Shen, M.;
submitted to the EMBL Data Library, August 1998
A;Description: Arabidopsis thaliana chromosome II BAC T9I4 genomic sequence.
A;Reference number: Z14710
A;Accession: T02739
A;Status: translated from GB/EMBL/DDBJ
A;Residues: 1-482 <ROU>
A;Cross-references: EMBL:AC005315; NID:g3461834; PID:g3461849
A;Estatus: translated source: cultivar Columbia
R;Lin, X.; Kaul, S.; Rounsley, S.D.; Shea, T.P.; Benito, M.I.; Town, C.D.; Fujii, C.Y
M.; Koo, H.; Moffat, K.S.; Cronin, L.A.; Shen, M.; VanAken, S.E.; Umayam, L.; Tallon, euss, D.; Nierman, W.C.; White, O.; Eisen, J.A.; Salzberg, S.L.; Fraser, C.M.; Venter Nature 402, 761-768, 1999
A;Title: Sequence and analysis of chromosome 2 of the clant arabidocate thaliana
                                                                           A;Introns: 80/2; 187/3; 238/3; 321/3; 351/3; 413/3; 453/2
C;Superfamily: Synechocystis cytochrome P450 slr0574; cyt
F;291-453/Domain: cytochrome P450 homology <P45>
                                                                                                                                                                                                           A;Cross-references: GB:AE002093; C;Genetics:
                                                                                                                                                        A; Gene: At2g29090;
A; Map position: 2
                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-482 <STO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                 A;Status:
                                                                                                                                                                                                                                                                                                                                         A; Reference number: A84420; A; Accession: D84692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЪ
                                                                                                                                                                                                                                                                                                                                                                                            A; Title: Sequence and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity 31.8 Matches 151; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10
                                                                                                                                                                                                                                                                                                              preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 F----GKDEVLYREDLKRCYYILEKGYNSMPVNLPGTLFHKSMKARKELSQILARILSER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RVIQETLRVASILSFTFREAVEDVEYEGYLIPKGWKVLPLFRNIHHSADIFSNPGKFDPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IFAARDTTASVMSWILKYLAENPNVLEAVTEEQMAI-RKDKEEGES-LTWGDTKKMPLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLG-WVLKHSNLSTEQILDLILSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HAKLRKLYLRAFMPESIRN-MVPDIESIAQDSLRSW-EGTMINTYQEMKTYTFNVALLSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KRYGSVFKTHVLGCPCVMISSPEAAKFVLVTKSHLFKPTFPASKERMLGKQAIFFHQGDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDM 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF 483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MSMDPGEEET---EQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LFAGSLFLYFLRCLISQRRFGSSKLPLPPGTMGWPYVGET - - - FQLYSQDP-NVFFQSKQ
                                                                                                                                                                                   T9I4.17
                                                                                                                                                                                                                                                                                                                                                                    analysis of chromosome
84420; MUID:20083487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        31.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       - VAPKPNTFMPFGNGTHSCPGNELAKLEMSIMIHHLTTKY
     22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -QNGSSH-----NDLLGSFMGDKEELTDEQIADNIIGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             92;
                                                                                                                                                                                                                                      NID: g3461849; PIDN: AAC33235.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pred. No. 1.5e-33;
2; Mismatches 176;
                                                                                                                                                                                                                                                                                                                                                                                               N
                                                                                                                                                                                                                                                                                                                                                                                               of the
                                                                                                     cytochrome
                                                                                                                                                                                                                                                                                                                                                                                            plant Arabidopsis thaliana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                      GSPDB:GN00139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             56;
                                                                                                     P450 homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              272
```

```
A;Gene: d13695c
A;Map position: 4COP9-4G3845
A;Map position: Synechocystis cytochrome P450 slr0574; cytochrome P450 c;Keywords: chromoprotein; heme; iron; metalloprotein; oxidoreductase F;433/Binding site: heme iron (Cys) (axial ligand) #status predicted
                                                                                                                                                                                                                                                                                                                             R;Bevan, M.; Bancroft, I.; Bent, E.; Love, K.; Goodman, H.; Dean, C.; Bergkamp, R.; P.; Wedler, H.; Wedler, E.; Wambutt, R.; Weitzenegger, T.; Pohl, T.M.; Terryn, N.; avanagh, T.; Hempel, S.; Kotter, P.; Entian, K.D.; Rieger, M.; Schaeffer, M.; Funk, Nature 391, 485-488, 1998
A;Authors: Mueller-Auer, S.; Silvey, M.; James, R.; Montfort, A.; Pons, A.; Puigdome erhoft, A.; Moores, T.; Jones, J.D.G.; Eneva, T.; Palme, K.; Benes, V.; Rechman, S.; C.; Chalwatzis, N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
C71417
                                                                                                                                                                                            A;Molecule type: DNA
A;Residues: 1-487 <BEV>
A;Cross-references: GB:Z97338; NID:g2244870; PIDN:CAB10309.1; PID:g2244888
                                                                                                                                                                                                                                                                                                                                                                                                                                                       cytochrome P450 d13695c - Arabidopsis thaliana
N;Contains: oxidoreductase (EC 1. -. -)
C;Species: Arabidopsis thaliana (mouse-ear cress)
A;Variety: columbia
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 16-Jun-2000
C;Accession: C71417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망. 양
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                     Ö
                                                                                                                                                                                                                                                                        A; Title: Analysis of 1.9 Mb of contiguous sequence A; Reference number: A71400; MUID:98121113 A; Accession: C71417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                       A; Status: nucleic acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
Query Match
Best Local Similarity
Matches 143; Conser
                                                                                                                                                                                   Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best Local Similarity Matches 153; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVL-----KHSNLSTEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VLKFNWELAEDDQPFAF-PFVDFPNGLPIRVSRI 512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PDPEKFDPSRFE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DTRKMPLTTRVIQETLRAASVLSFTFREAVQDVEYDGYLIPKGWKVLPLFRRIHHSSEFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IADNIIGVIFAATDTTASVLTWLLKYLHDHPNLLQEVSREQFSIRQKIKKE--NRRISWE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AKHIMSMDPGEEE----TEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPYHSTLKRLVQSSFMPSALRPTV--SHIELLVLQTLSSWTSQKSINTLEYMKRYAFDVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GDMHRDM-RSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLM 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TRONKYGDIFKTHILGCPCVMISSPEAARMVLVSKAHLFKPTYPPSKERMIGPEALFFHO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PALITLTIVVVVVVLLFKWWLHWKEQRLRLPPGSMGLPYIGET - - - LRLYTENP-NSFFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PSLLSLLLFLILLK-----RRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTSFRWEVIGDEEGIQYGPFPVPKKGLPIRVTPI 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEI-ARAKKELGESELNWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---IMSAFGDKEEPTTIDVIKLLYQRLERGYNSMPLDLPGTLFHKSMKARIELSEELRKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
   Conservative
                    21.7%;
27.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29.88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101;
   100;
                                                                                                                                                                                                                                                         not shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pred. No. 3.5e
1; Mismatches
                    Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -VAPKPYTYMPFGNGVHSCPGSELAKLEMLILLHHL
Mismatches
                                581;
                                                                                                                                                                                                                                                         translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3.5e-32;
ches 192;
                    .1e-30;
                                     DΒ
                                       1.
   205;
                                                                                                                                                                                                                                                                                                              from chromosome
                                 Length 487;
                                                                                                                                                                                                                                                         not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
   Indels
                                                                                                                                                                                                                                                         shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       68;
   76;
                                                                                                                                                                                                                                                                                                              4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
   Gaps
                                                                                                                                                                                                                                                                                                              of Arabidopsis
                                                                                                                            homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                283
                                                                                                                                                                                                                                                                                                                                                                 Puigdomenec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13;
   11;
                                                                                                                                                                                                                                                                                                                                              s.;
                                                                                                                                                                                                                                                                                                              tha
                                                                                                                                                                                                                                                                                                                                                                                                                     Dirk
Giel
                                                                                                                                                                                                                                                                                                                                                                                                    ₩.
                                                                                                                                                                                                                                                                                                                                                Āns
```

Oy Oy

14 65

GDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWS

LCIAATISSTLFFFRKKHHRFITKKIQKKKK--LLPGEMGLPWIGETMDFYKAQKSNRVF

```
A; Title: Sequence and analysis of chromosome A; Reference number: A84420; MUID:20083487 A; Recession: A84859 A; Status: preliminary A; Molecule type: DNA A; Residues: 1-485 (STO) A; Cross-references: GB:AE002093; NID:g4512670 A; Cross-references: GB:AE002094; NID:g4512670 A; Cross-references: GB:AE002094; NID:g4512670 A; Cross-references: GB:AE002094;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         probable cytochrome P450 [imported] - Arabidopsis thaliana
C;Species: Arabidopsis thaliana (mouse-ear cress)
C;Date: 02-Feb-2001 #sequence_revision 02-Feb-2001 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A84859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R;Lin, X.; Kaul, S.; Rounsley, S.D.; Shea, T.P.; Benito, M.I.; Town, C.D. M.; Koo, H.; Moffat, K.S.; Cronin, L.A.; Shen, M.; VanAken, S.E.; Umayam euss, D.; Nierman, W.C.; White, O.; Eisen, J.A.; Salzberg, S.L.; Fraser,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вр
                                                                                                                                                                                                   A;Map position: 2
C;Superfamily: Synechocystis cytochrome P450 slr0574;
C;Keywords: heme; iron; metalloprotein
F;432/Binding site: heme iron (Cys) (axial ligand) #st
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               C; Accession: A84859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20
Ş
                                                                                                                                                                                                                                                                                                                                     A; Gene: At2g42850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nature 402, 761-768, 1999
                                                           Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   77
                                                                                              Local
   12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SLLSLLLELILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVSKYG
                                                               147;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FAKMQMAVFIHHL-FRYRWSMKSGTTIIRSFMLMFPGGCDVQIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SLFLVKIFHWVYQWRNPKTNGKLPPGSMGFPFIGETFEFFKPHDALQFSTFIKDRVLRFF
LLLLPSLLSLLLFL-----ILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTAT-TL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    G-YPHIHFNSEKYEDPYAFNPWRWEGKDLGAIVS-----KTFIPFGAGRRLCVGAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKAE-KEGGLTWEDYKSMHFTQMVINESLRIISTAPTVLRVLEHDFQVGDYTIPAGWTFM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EADISWOARKRMMKLLRKTVLTKRASGEELGEFFNIIFGEMEGE--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KILIGCLAKKVMGEMEP--EAAKELALCWRYFQSGWFRFFLNLPGTGVYKMMKVLFVQYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KETENLMAKHIM-SMDPGEEETEQLKKEYVTEMKGVVSAPLNLPGTAYHKAL------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ENNLFLQSKESHKHVRNLTFQLLGPQGLKSRMIEDVDLLARTYMEEGARNGYLDVKETSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADFSSIHLSFFRTSLFGDKAIISMDMELN------LEMAKANSVPGVTKSVIRLFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----KIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGI------LG
                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -GETMSVENAVEYIYTFFLVANETTPRILAATVKFISDHPKVKQELQREHEEIVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -QSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDL
                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                             GB:AE002093; NID:g4512670; PIDN:AAD21724.1; GSPDB:GN00139
                                                                                           21.6%;
                                                               107;
                                                                                     Score
Pred.
                                                               Mismatches
                                                                                     579.5; DB 2
No. 3.9e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2 of the plant Arabidopsis thaliana
                                                               203;
                                                                                                                                                                                                                #status
                                                                                                                       2
                                                                                                                                                                                                                                                                     cytochrome P450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        510
                                                               Indels
                                                                                                                 Length
                                                                                                                                                                                                             predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Town, C.D.; Fujii,
                                                               53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  23-Mar-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Umayam,
                                                           Gaps
                                                                                                                                                                                                                                                                         homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  172
   64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C.M.;
                                                               11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Tallon,
Venter
```

```
RESULT 11

H86185

Aypothetical protein [imported] - Arabidopsis thaliana
C;Species: Arabidopsis thaliana (mouse-ear cress)
C;Species: Arabidopsis thaliana (mouse-ear cress)
C;Date: 02-Mar-2001 #sequence_revision 02-Mar-2001 #text_change 31-Mar-2001
C;Accession: H86185
R;Theologis, A; Ecker, J.R.; Palm, C.J.; Federspiel, N.A.; Kaul, S.; White, O.; Alonso, Chin, C.W.; Chung, M.K.; Conn, L.; Conway, A.B.; Conway, A.R.; Creasy, T.H.; Dewar, K.; ansen, N.F.; Hughes, B.; Huizar, L.
Nature 408, 816-820, 2000
A;Authors: Hunter, J.L.; Jenkins, J.; Johnson-Hopson, C.; Khan, S.; Khaykin, E.; Kim, C. C.A.; Li, J.H.; Li, Y.; Lin, X.; Liu, S.X.; Liu, Z.A.; Luros, J.S.; Maiti, R.; Marziali, Rizzo, M.; Rooney, T.; Rowley, D.; Sakano, H.
A;Authors: Salzberg, S.L.; Schwartz, J.R.; Shinn, P.; Southwick, A.M.; Sun, H.; Tallon, ker, M.; Wu, D.; Yu, G.; Fraser, C.M.; Venter, J.C.; Davis, R.W.
A;Afference number: A86141; MUID:21016719
A;Accession: H86185
A;Accession: H86185
밁
                                        Q
                                                                                           밁
                                                                                                                                         Ş
                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ġ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                            A; Map position: 1
C; Superfamily: Synechocystis cytochrome P450 slr0574; cytochrome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Cross-references: GB:AE005172; NID:g2388581; PIDN:AAB71462.1; GSPDB:GN00141 C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-490 <STO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               125
                                                                                                                                               92
                                                                                                                                                                                             40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          72
                                                                                                                                                                                                                                           34 KTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVSKYGK--IYRSNLFGEPTIVS
                                                                                                                                                                                                                                                                                           Local Similarity 28.6 es 133; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KFNWELAEDDOPFAFPFVDFPN-GLPIRVS 510
TYIPYIEENVITVLDKWTKMGEFEFLTHLRKLTFRII-MYIFLSSESENVMDALEREYTA 217
                                           ILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVT 211
                                                                                                                                                                                             ENRHYLPPGDLGWPFIGNMLSFLRAFKTSDPDSFTRTLIKRYGPKGIYKAHMFGNPSIIV 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNMVLLVFAAHDTTSYAMSMTFKMLAQHPTCRDTLLQEHAQI----KANKGEGEYLTVEDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESE-LNWDDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FTVVFECLYGIKVEIGMLEV----FERVLEGVFALPVEFPCSKFARAKKARLEIETFL
                                                                                              TTSDTCRRVLTDDD-AFKPGWPTSTMELIGRKSFVGISFEEHKRLRRLTAAPVNGHEALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GFDWSLVYPDETISMDPLPFPSLGMPIKIS 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PMSFDPTRFDKPIQAYT------YLPFGGGPRLCAGHQLAKISILVFMHFVVT 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVL 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KKMKYSWQVVRETMRLSPPIFGSFRKAVADIDYGGYTIPKGWKILWTTYGTHYNPEIFQD 40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VGKVREKRREMEKEGAE------KPNTTLFSRLVEELIKGV-----ITEEEVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQIL 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FNLMAKHI--MSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFT 184
                                                                                                                                         ADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IMAKQGEKHRVLRGIVANSLSYIGLESLIPKLCDTVKFHHETEWRGKEEISLYRSAKVLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDFVNPRIIKHGNIFKTRIMGSPTIVVNGAEANRLILSNEFSLVVSSWPSSSVQLMGMNC
                                                                                                                                                                                                                                                                                         21.6%; Score 579.5; DB 2; 28.6%; Pred. No. 4e-30; tive 107; Mismatches 192;
                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                              ω
ω
•
                                                                                                                                                                                                                                                                                                                                                                                                                   P450 homology
                                                                                                                                                                                                                                             91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               287
                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C;Genetics:
A;Gene: ATSP:F14D17.40
A;Gene: ATSP:F14D17.40
A;Map position: 3
A;Introns: 70/2; 178/3; 229/3; 312/3; 343/3; 346/1; 381/3
C;Superfamily: Synechocystis cytochrome P450 s1r0574; cytochrome P450 homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Status: Free: DNA
A;Nolecule type: DNA
A;Residues: 1-455 <JOR>
A;Cross-references: EMBL:AL353992; GSPDB:GN00061; ATSP:F14D17.40
A;Cross-references: cultivar Columbia; BAC clone F14D17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cytochrome P450-like protein - Arabidopsis thaliana N;Alternate names: protein F14D17.40 C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 02-Jun-2000 #sequence_revision 02-Jun-2000
                    밁
                                                               S
                                                                                                                     밁
                                                                                                                                                              Š
                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                               ž
                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Reference number: Z25008
A; Accession: T48973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R;Jordan, N.; Bangert, S.; Wiedelmann, R.; Voss, H.; Unseld, submitted to the Protein Sequence Database, April 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C; Accession: T48973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                     148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 212
                                                                                                                                                                                                                                                                                                                                                                                                                   88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               28
                    VTQDTTSKAICLAVKFLLENPKVLAELKKEH-EVILESREDKEGGVTWEEYRHKMTFTN-
                                                                  AGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYK-KMDFTQC
                                                                                                                                                                EDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSN-----LSTEQILDLILSLLF
                                                                                                                                                                                                                    KLMGIFKAFTFDWFRTSYLISAGKGLYNTLW--ACREGMREIKDIYTMRKTSEEKY----
                                                                                                                                                                                                                                                                                                                     KILKDMDRVTREHLSSKAKTGRLDVKDAVSKLIIAHLTPKMMS-----NLKPQTQA 198
                                                                                                                                                                                                                                                                                                                                                                ILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVT
                                                                                                                                                                                                                                                                                                                                                                                                                   TDKDVNMEILRQENKSFILSYPDGLMKPLGKDSLFLKIGNIHKHIKQITLHLLSSEGLKR 147
                                                                                                                                                                                                                                                                                                                                                                                                                                          NPKSNGKLPPGSMGFPIIGETLDFFKPYGFYEISPYLKKKMLRYGPLFRTNILGVKTVVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NRKTRENLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FLPFGAGSHLCPGNDLAKLEISIFLHHFLLKYQVKRSNPECPVMY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VEMNGYLIPKGWKVLTWFRDVHIDPEVFPDPRKFDPARW---DNG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LNYGVRAMAVNIPGFAYHRALKARKTLVAAFQSIVTERR-----NQRKQNILSNKKDML
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EVLQRAKAEQEMILKSRPE-GQKGLSLKETRKMEFLSQVVDETLRVITFSLTAFREAKTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DNLLNVK----DED-----GKTLDDEEIIDVLLMYLNAGHESSGHTIMWATVFLQEHP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity 28.9
45; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     21.5%;
28.9%;
                                                                                                                                                                                                                                                                  -VSAPLNLPGTAYHKALQSRATILK--FIERKMEERKLDIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 577; DB 2;
Pred. No. 5.2e-30;
4; Mismatches 173;
                                                                                                                     DDFLNTAIEESEKAGELLNENAITLIFTLSC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         02-Jun-2000 #text_change 18-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           M.; Mewes, H.W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            428
                                                                                                                                                                                                                                                                    255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    320
                                                                                                                                                                                                                      252
```

Rudd, ß

10;

```
.
9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                probable cytochrome P450 [imported] - Arabidopsis thaliana (Species: Arabidopsis thaliana (mouse-ear cress) C; Species: Arabidopsis thaliana (mouse-ear cress) C; Date: 02-Feb-2001 #sequence_revision 02-Feb-2001 #text_change 16-Feb-2001 C; Accession: B84733 R; Lin, X; Kaul, S; Rounsley, S.D.; Shea, T.P.; Benito, M.I.; Town, C.D.; Fujii, C.Y.; M.; Koo, H.; Moffat, K.S.; Cronin, L.A.; Shea, M.; VanAken, S.E.; Umayam, L.; Tallon, L. euss, D.; Nlerman, M.C.; White, O.; Eisen, J.A.; Salzberg, S.L.; Fraser, C.M.; Venter, J. a.; Shea, T.P.; Shea, T.P.; Salzberg, S.L.; Fraser, C.M.; Venter, J. a.; Shea, T.P.; Shea, T.P.; Salzberg, S.L.; Fraser, C.M.; Venter, J. a.; Shea, T.P.; S
                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Map position: 2
C; Superfamily: Synechocystis cytochrome P450 slr0574; cytochrome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         õ
Š
                                                                                                                                Qy
                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                               á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
A; Residues: 1-489 <STO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Title: Sequence and analysis of chromosome 2 of the plant Arabidopsis thaliana. A;Reference number: A84420; MUID:20083487 A;Accession: B84733
                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Gene: At2g32440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Cross-references: GB:AE002093; NID:g3831452; PIDN:AAC69934.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Nature 402, 761-768, 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                370
   470
                                                                         396
                                                                                                                                           410
                                                                                                                                                                                                                                                                                  350
                                                                                                                                                                                                                                                                                                                                                           287
                                                                                                                                                                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ·
00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DDQPFAFPFVDFPNGLPIRVSR 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAE 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWR 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TLLPLLLLPSLLSLLLFLI--LLKRRN-----RKTRFNLPPGKSGWPFLGETIGYLK 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGLILMWFP-LIILGLFVLKWVLKRVNVWIYVSKLGEKKHYLPPGDLGWPVIGNMWSFLR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DCEVLRVPAAHLPNGISINISK 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WEGKELRAGS------KTFMVFGTGLRQCAGAEFARLQISVFLHHLVTTYNFSLHQ 429
                                                                         RNVHLDPEIYPDPKKFDPSRWE------GYTPKAGTFLPFGLGSHLCPGNDLAK
                                                                                                                                       SAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAK
                                                                                                                                                                                                                RAPGQKLTLKETREMYYLSQVIDETLRVITFSLTAFREAKSDVQMDGYIIPKGWKVLTWF
                                                                                                                                                                                                                                                                                                                                                                                                                          VLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KKLVAAFQSIVTNRRNQRKQNISSNRKDMLDNLIDVKDE-----NGRVLDD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FLSHLRKLTFKVI-MYIFLSSESEHVMDSLEREYTNLNYGVRAMGINLPGFAYHRALKAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TMKLIGRKSFVGISFEEHKRLRRLTSAPVNGPEALSVYIQFIEETVNTDLEKWSKMGEIE 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AFKTSDPESFIQSYITRYGRTGIYKAHMFGYPCVLVTTPETCRRVLTDDD-AFHIGWPKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PYTATTLGDFMQQHVSKYGK--IYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRS 115
   LEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLP----
                                                                                                                                                                                                                                                                               ELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----ATILKFIERKMEERKLDI--KEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative 105; Mismatches
                                                                                                                                                                                                                                                                                                                                                    ·EEIIDLLLMYLNAGHESSGHLTMWATILMQEHPMILQKAKEEQERI--VKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20.4%; Score 547.5; DB 2; 27.6%; Pred. No. 4.6e-28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -MKSGYTIPAGWIVMIIPSVVHFDPEIYENPFEFNPWR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            211;
   -IRVSRIL 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSPDB:GN00139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           379
                                                                                                                                                                                                                                                                                                                                                                                                                          349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14;
```

```
R;Theologis, A.; Ecker, J.R.; Palm, C.J.; Federspiel, N.A.; Kaul, S.; Wh Chin, C.W.; Chung, M.K.; Conn, L.; Conway, A.B.; Conway, A.R.; Creasy, ansen, N.F.; Hughes, B.; Huizar, L.

Nature 408, 816-820, 2000

A;Authors: Hunter, J.L.; Jenkins, J.; Johnson-Hopson, C.; Khan, S.; Khay C.A.; Li, J.H.; Li, Y.; Liu, X.; Liu, S.X.; Liu, Z.A.; Luros, J.S.; Mait Rizzo, M.; Rooney, T.; Rowley, D.; Sakano, H.

A;Authors: Salzberg, S.L.; Schwartz, J.R.; Shinn, P.; Southwick, A.M.; Sker, M.; Wu, D.; Yu, G.; Fraser, C.M.; Venter, J.C.; Davis, R.W.

A;Title: Sequence and analysis of chromosome 1 of the plant Arabidopsis. A;Accession: D96813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        hypothetical protein T30F21.17 [imported] - Arabidopsis thaliana C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 02-Mar-2001 #sequence_revision 02-Mar-2001 #text_change 31-Mar-2001 C;Accession: D96813
                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                               В
                                                                                                                    δÃ
                                                                                                                                                             B
                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Gene: T30F21.17
A; Map position: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1-460 <S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C; Accession: D968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Residues: 1-460 <STO>
A; Cross-references: GB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        444
430
                                                                               383
                                                                                                                        426
                                                                                                                                                                 341
                                                                                                                                                                                                          367
                                                                                                                                                                                                                                                                                          308
                                                                                                                                                                                                                                                                                                                                   232
                                                                                                                                                                                                                                                                                                                                                                                                                   189
                                                                                                                                                                                                                                                                                                                                                                                                                                                          193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FSMVQDSEIIRSPFHQYTKDLLINISQ 456
                                      WELAEDDQPFAFPFVDFPNGLPIRVSR 511
                                                                                                                                                                                                                                                                                                                                                                        IKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKH-----SNLSTEQILDLILS
                                                                                                                                                                                                                                                                                                                                                                                                                                                      MSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDM 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MLMVALVVVRISHWLYRWSNPKCPGKLPPGSMGFPIIGETLDFFKPCGVEGIPTFVKKRM
                                                                                                                    NPWRWQQQNNGASSSGSGSFSTWGN-NYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFN
                                                                                                                                                               TNMVSNEVLRLANTTPLLFRKAVQDVEIKGKY-----
                                                                                                                                                                                         TQCVINETLRLGNVVRFLHRKALKDVRYKG-YDIPSGWKVLPVISAVHLDNSRYDQPNLF
                                                                                                                                                                                                                                                   LAFALREGTSSCTALAVKFISKDPKVLAELKREHKAIVDNRKD-KEAGVSWEEYRHNMTF
                                                                                                                                                                                                                                                                                      LLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYK-KMDF
                                                                                                                                                                                                                                                                                                                                                                                                                 ISNLKPETQSKLIDN------LNAFNLDWFKSF-LRLSTWKAVTKALKSR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HKYLQKITMQILGSEGLKQTMLGNMDKATRDHIRSIASQGSFNVRKEVENLVVAYMTPKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHI 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IRYGPLFRTNIFGSKTVVSTDPDVIHQIFRQENTSFELGYPDIFVKVFGKDNLFLKEVFI 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative 102;
                                                                                                                                                                                                                                                                                                                                 EEAIQVMKDVLMMRKETREKQ----EDFLNTLLEELEKDGSFFDQGSAINLIFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GB:AE005173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18.6%; Score 497.5; DB 2 26.2%; Pred. No. 7.3e-25;
                                                                               GKEMIWGSKTFMAFGYGVRLCVGAEFSRLQMAIFLHHLVAYYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NID: 94836883; PIDN: AAD30586.1; GSPDB: GN00141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 205;
                                                                                                                                                                 ---YLEVIHMGFG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <u>ب</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Southwick, A.M.; Sun,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S.; White, (reasy, T.H.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Khaykin, E.; Kim,
Maiti, R.; Marzia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                        484
                                                                                                                                                                                                                                                                                                                                   281
                                                                                                                                                                                                                                                                                                                                                                                                                                                        252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     68
                                                                                  429
                                                                                                                                                                 382
                                                                                                                                                                                                          425
                                                                                                                                                                                                                                                   340
                                                                                                                                                                                                                                                                                          366
                                                                                                                                                                                                                                                                                                                                                                        307
                                                                                                                                                                                                                                                                                                                                                                                                                   231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  н.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 o
..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Dewar,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Alon
```

RESULT

```
A;Description: involved in an early step in gibberellin biosynthesis A;Pathway: gibberellin biosynthesis C;Superfamily: Syncchocystis cytochrome P450 slr0574; cytochrome P450 homology C;Keywords: oxidoreductase F;325-488/Domain: cytochrome P450 homology <P45>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         T02263

cytochrome P450 DWARF3 - maize
N;Contains: oxidoreductase (EC 1.-.-.)
C;Species: Zea mays (maize)
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 21-Jul-2000
C;Accession: T02263
Search completed: September 28, Job time: 95 sec
                                                                                                                                                                õ
                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: mRNA
A;Residues: 1-519 <WIN>
A;Cross-references: EMBL:U32579; NID:g987266; PIDN:AAC49067.1; PID:g987267
A;Experimental source: strain B73
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 R:Winkler, R.G.; Helentjaris, T.
Plant Cell 7, 1307-1317, 1995
A:Title: The maize dwarf3 gene encodes a cytochrome A:Reference number: Z14648; MUID:96004534
A:Accession: T02263
                                                                                                                       밁
                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                당. 왕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C; Function:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Gene: dwarf3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 18.3
Best Local Similarity 28.2
Matches 129; Conservative
                                                                                                                                            446 STWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF 483
                                                                                                                                                                                                                                                  386 RKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSF 445
                                                                                                                                                                                                                                                                                                                                              326 FLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLH 385
                                                                                                                                                                                                                                                                                                                                                                                                                     306
                                                                                                                                                                                                                                                                                                                                                                                                                                            266 EDEAEMSKSDHYRKQRTDDDLLGWYLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIF 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          187 YLPFIDRTVTSSLRAWADHGGSVEFLTELRRWTFKIIVQ-IFLGGADQATTRALERSYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        129 AEGCKQVLMDDDA--FVTGWPKATVALVGPRSFVAMPYDEHRRIRKLTAAPINGFDALTG 186
                                                                                                                                                                                                                                                                                                                    343 FLQENPDMFARAKAEQEAIMRSIPS-SQRGLTLRDFRKMEYLSQVIDETLRLVNISFVSF 401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              246 LNYGMRAMAINLPGFAYRGALRARRRLVAVLQGVLDERRAARAKGVSGGGVDMMDRLIEA 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        153 LLKDVERHTLFVLDSW-QQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVT 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         93 DAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTI 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     36 RFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQHVSKYGK--IYRSNLFGEPTI-VSA 92
                                                                                                                                                                                                                                                                                                                                                                                                                  QDE-----RGRHLDDD-------EIIDVLVMYLNAGHESSGHITMWATV 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RÅRLPPGEMGWPLVGGMWAFLRAFKSGKPDAFIASFVRRFGRTGVYRSFMFSSPTVLVTT 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKLDIKE-----EDQEEEEEVKT 265
                                                                                                                  -----LAFGLGARLCPGNDLAKLEISVFLHHFLLGY 487
                                                                                                                                                                                                                   RQATRDVFVNGYLIPKGWKVQLWYRSVHMDPQVYPDPTKFDPSRWE-----GHSPRAGTF 456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     91;
                    2001, 18:45:05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 491.5; DB 1;
pred. No. 2.1e-24;
91; Mismatches 189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P450-mediated early step in gibbere
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels 49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 519;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11;
```

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Total number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ĕ
     on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                              978.5
978.5
503
439
     279.5

263.5

263.5

263.5

255.5

255.5

256.5

256.5

244.5

244.5

244.5

244.5

234.5

234.5

234.5

234.5

234.5

234.5

234.5

234.5

234.5

234.5

233.5

233.5

233.5

233.5

233.5

233.5

233.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ٠.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          seq length:
seq length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-502-426-2
2681
1 MFFFFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Issued_Patents_AA:*
1: /cgn2_6/ptodata/2
2: /cgn2_6/ptodata/2
3: /cgn2_6/ptodata/2
4: /cgn2_6/ptodata/2
5: /cgn2_6/ptodata/2
6: /cgn2_6/ptodata/2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
     BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197339 segs, 20590346 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          September 28, 2001, 18:43:30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version 4.5
Copyright (c) 1993 - 2000 Com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MFETEHHTLLPLLLPSLLS.....FAFPFVDFPNGLPIRVSRIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/BCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2000000000
     5006668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapext 0.5
US-08-622-166A-2
US-08-622-166A-4
US-08-724-466B-4
US-08-724-466B-4
US-08-948-564-6
US-09-091-432-2
US-08-457-274A-25
PCT-US95-05758-25
US-08-201-118-7
US-08-238-821B-7
PCT-US95-05744-7
US-08-948-564-16
US-08-966-505B-6
US-08-9616-990-66
US-08-313-075A-38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; Search time 14.33 Seconds (without alignments) 737.114 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                197339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Description
                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
Sequence
Sequence
Sequence
                6, Appli
25, Appli
25, Appli
30, Appli
7, Appli
7, Appli
16, Appli
16, Appli
16, Appli
17, Appli
17, Appli
17, Appli
17, Appli
18, Appli
18, Appli
19, Appli
19, Appli
11, Appli
                                                                                                                                                                                                                                                                                                                                Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
```

δÃ

12 LLLLPSLLSLLLELILLKRRNRKTRENLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH 71

Query Match 36.5%; Score 978.5; DB 2; Length 472; Best Local Similarity 41.9%; Pred. No. 2.1e-89; Matches 210; Conservative 79; Mismatches 171; Indels 41; Gaps 8;	INFC SE I MO	CLASSIFICATION: 800 ; ATTORNEY/AGENT INFORMATION: ; NAME: SVENSSON, LEONARD R. ; REGISTRATION NUMBER: 30,330 ; REGISTRATION NUMBER: 0147-0153P ; PEFERENCE/DOCKET NUMBER: 0147-0153P ; TELECOMMUNICATION INFORMATION: ; TELEPHONE: (703) 205-8000 ; TELEPHONE: (703) 205-8000	COMPUTER READABLE FORM:  MEDIUM TYPE: Floppy disk  COMPUTER: IBM PC compatible COMPUTER: IBM PC compatible SOFTWARE: Patentin Release #1.0, Version #1.30 (EPO) CURRENT APPLICATION UNMEER: US/08/622,166A FILING DATE: 27-MAR-1996	CORRESPONDENCE ADDRESS ADDRESSEE: Birch, S STREET: P.O. BOX 74 CITY: Falls Church STATE: Virginia COUNTRY: USA	Seq Pat GE	ALIGNMENTS  RESULT 1 US-08-622-166A-2	28 223.5 8.3 496 4 US-09-292-768-64 29 223 8.3 490 1 US-08-201-118-3 30 223 8.3 490 2 US-08-28-821B-3 31 223 8.3 490 2 US-08-298-31B-3 32 222 8.3 490 1 US-08-201-118-9 33 222 8.3 490 1 US-08-201-118-9 34 222 8.3 490 2 US-08-201-118-9 35 222 8.3 490 2 US-08-281B-9 36 221.5 8.3 516 3 US-08-281B-9 37 221.5 8.3 500 2 US-08-314-601-2 38 218 8.1 510 3 US-08-948-564-12 39 215 8.0 500 5 PCT-US95-13051-2 39 215 8.0 500 3 US-08-881-784-9 40 214.5 8.0 496 3 US-08-881-784-1 41 214.5 8.0 496 4 US-09-292-768-6 42 214.5 8.0 496 4 US-09-292-768-6 43 214 8.0 490 1 US-08-238-821B-13 45 214 8.0 490 2 US-08-238-821B-13 46 214 8.0 490 2 US-08-238-821B-13 5equence 13, Appl 45 214 8.0 490 5 PCT-US95-05744-13 5equence 13, Appl
--	-----------------------	---	---	--	------------------	---------------------------------------	--

8

```
US-08-622-166A-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 4, Application US/08622166A Patent No. 5952545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
  INFORMATION FOR SEQ ID NO:
                                                            REGISTRATION NUMBER: 30,330
REFERENCE/DOCKET NUMBER: 0147-0153P
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 205-8000
                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION: NUCLEIC ACID MOLECULES ENCODING CYTOCHROME TITLE OF INVENTION: P450-TYPE PROTEINS INVOLVED IN THE BRASSINOSTEROID SYNTHESIS
                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                        SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: ALTMANN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
        TELEFAX: 1.248345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           372 NETLRIGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQ 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          233 VVVMKRREEEEEGAE-------RKKDMLAALLAADDGFSDEEIVDFLVALLVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  124 LHKRMHSLTMSFANSSIIKDHLMLDIDRLVRFNLDSWSSRVLL--MEEAKKITFELTVKQ 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           132 MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          192 IMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKL
                                                                                                                                                                                       APPLICATION NUMBER: US/08/622,166A FILING DATE: 27-MAR-1996 CLASSIFICATION: 800
                                                                                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE: Birch, St
STREET: P.O. Box 747
CITY: Falls Church
STATE: Virginia
                                                          TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DKLVFFPTTRTQKRYPIFVKR 467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOPFAFPFVDFPNGLPIRVSR 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVI 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFA 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NETLRVANIIGGVFRRAMTDVEIKGYKIPKGWKVFSSFRAVHLDPNHFKDARTFNPWRWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GYETTSTIMTLAVKFLTETPLALAQLKEEHEKIRAMKSD--SYSLEWSDYKSMPFTQCVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LMSFDPG-EWSESLRKEYLLVIEGFFSLPLPLFSTTYRKAIQAR-----RKVAEALT 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARYGSVFMTHLFGEPTIFSADPETNRFVLQNEGKLFECSYPASICNLLGKHSLLLMKGS 123
                                                                                                                                                                                                                                                                                                                                                                                            22040-0747
                                                                                                                                                   SVENSSON, LEONARD R.
                                 (703) 205-8050
                                                                                                                                                                                                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MATHUR, JAIDEEP
SZEKERES, MIKLOS
ALTMANN, THOMAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KONCZ, CSABA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SNSVTTGPSNVFTPFGGGPRLCPGYELARVALSVFLHRLVTGFSWVPAEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Stewart,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Kolasch
                                                                                                                                                                                                                                                                                 Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 & Birch, LLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-724-466B-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-08-622-166A-4
                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/08724466B Patent No. 6063606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 36.5%;
Best Local Similarity 41.9%;
Matches 210; Conservative 7
                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
APPLICANT: Petkovich, P. Martin, White, Ja
APPLICANT: Beckett, Barbara R., Jones, Gle
TITLE OF INVENTION: Retinoid Metabolizing
NUMBER OF SEQUENCES: 30
                                                                            ZIP: M5L 1A9
COUNTRY: Canada
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3 1.
COMPUTER: COMPAQ, IBM PC CO
OPERATING SYSTEM: MS-DOS 5
SOFTWARE: WORD PERFECT
                                                            CURRENT APPLICATION DATA
                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 472 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    491 DQPFAFPFVDFPNGLPIRVSR 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    279 GYETTSTIMTLAVKFLTETPLALAQLKEEHEKIRAMKSD--SYSLEWSDYKSMPFTQCVV 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          312 GHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVI 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   124
                                                                                                                                                                                                                               CITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         233 VVVMKRREEEEEGAE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       132 MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH 191
             APPLICATION NUMBER: US/08/724,466B FILING DATE: October 1, 1996
                                                                                                                                                                                                                                                        ADDRESSEE: Blake, Cassels & Graydon STREET: Box 25, Commerce Court West
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          72 VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12 LLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7 LLLLSSIAAGFL---LLLRRTRYRRMGLPPGSLGLPLIGETFQLIGAYKTENPEPFIDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LHKRMHSLTMSFANSSIIKDHLMLDIDRLVRFNLDSWSSRVLL--MEEAKKITFELTVKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DKLVFFPTTRTQKRYPIFVKR 467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NETLRVANIIGGVFRRAMTDVEIKGYKIPKGWKVFSSFRAVHLDPNHFKDARTFNPWRWQ 396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFA 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LMSFDPG-EWSESLRKEYLLVIEGFFSLPLPLFSTTYRKAIQAR-----RKVAEALT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARYGSVFMTHLFGEPTIFSADPETNRFVLQNEGKLFECSYPASICNLLGKHSLLLMKGS 123
APPLICATION
                                                                                                                                                                                                                                      Toronto
                                                                                                                                                                                                                                                                                                                                                             Petkovich, P. Martin, White, Jay A., Reckett, Barbara R., Jones, Glenville
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -SNSVTTGPSNVFTPFGGGPRLCPGYELARVALSVFLHRLVTGFSWVPAEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          79;
                                                                                                    compatible 5.1
                                                                                                                                             1/2 inch, 1.4 Mb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 978.5; DB 2;
Pred. No. 2.1e-89;
9; Mismatches 171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -- RKKDMLAALLAADDGFSDEEIVDFLVALLVA
                                                                                                                                                                                                                                                                                                                                             Protein
                                                                                                                                                 storage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels 41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 472;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63
```

δÃ 밁 Q 밁 Ş 밁 Ş 밁 õ 밁 Ş В Ş 밁 Š В

밁

APPLICATION NUMBER: 01 FILING DATE: June 21,

08/667,546

٠.

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                              RESULT 4
US-08-724-466B-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-724-466B-2
                                                                                                                                                                                         Sequence 4, Application US/08724466B Patent No. 6063606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEFAX: (416) 863-26
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE/DOCKET NUMBER: 50
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 863-4344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE CHARACTERISTICS:
LENGTH: 492 amino acids
TYPE: amino acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATTORNEY/AGENT INFORMATION: NAME: Hunt, John C.
                                                                                            APPLICANT: Petkovich, P. Martin, White, Jay A., APPLICANT: Beckett, Barbara R., Jones, Glenville TITLE OF INVENTION: Retinoid Metabolizing Protein NUMBER OF SEQUENCES: 30
                                                                         CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   119
                                                                                                                                                                                                                                                                                                                                           467 LAKLEMAVFIHHLVLKFNWELAEDDQ-----PFAFPFVDFP 502
                                                                                                                                                                                                                                                                                                                                                                                                                        407
                                                                                                                                                                                                                                                                                                                                                                                                                                                             332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               233 GLRAR----NFIHSKIEENIRKKIQDDDNENEQKYKDALQLL----IENSRRSDE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         119
                   STREET:
CITY: T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59 YTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Match 18.8%;
Local Similarity 27.6%;
                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4 YTLMVTFLCTIVLPVLLFLAAVKLWEMLMIRRVDPNCRSPLPPGTMGLPFIGETLQLI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7 HTLLPLLLLPSLLSLLLFL------ILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LG----ESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVL 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---LQRRKFLRMKRQKYGCIYKTHLFGNPTVRVMGADNVRQILLGEHKLVSVQWPASVRT
                                                                                                                                                                                                                                                                                                       FAKVLLKIFLVELTQHCNWILSNGPPTMKTGPTTYPVDNLP 483
                                                                                                                                                                                                                                                                                                                                                                                  YSICDTHDVADVFPNKEEFQPERFM-----SKGLEDGSRF--NYIPFGGGSRMCVGKE
                                                                                                                                                                                                                                                                                                                                                                                                                      PVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                           MGMYTPGKGLSMELLDQLKYTGCVIKETLRINPPVPGGFRVALKTFELNGYQIPKGWNVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CVLVYPEMKKLMFRIAMRILLGFEPEQIKTDEQELVEAFEEMIKNLFSLPIDVPFSGLYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ILGSDTLSNVHGVQHKNKKKAIMRAFSRDALEH-----YIPVIQQEVKSAIQEWLQKDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ILGKWSMLVLVGDMHRD-----MRSISLNFLSHARLRTILLKDVERHTLFVLDSW-QQNS 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----PFSLQAMKEAATELLFGGHETTASTATSLVMFLGLNTEVVQKVREE----VQEKVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IFSAQDEAKKFTFNLMAKHIMSMDPGEEET--EQLKKEYVTFMKGVVSAPLNLPGTAYHK
Toronto
M5L 1A9
                                     Box 25,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (416) 863-2653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linear
                                                         Blake, Cassels & Graydon
                                       Commerce Court West
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    36,424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       50767/00004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 503; DB 3; Pred. No. 8.4e-42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches 216; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 3; Length 492;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                  442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                           391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14;
```

```
δÃ
                                                                                  망
                                                                                                                      QΥ
                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                  В
                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-724-466B-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches 142;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: 08/667.54
ETLING DATE: June 21, 1996
ATTORNEY AGENT INFORMATION:
NAME: Hunt, John C.
REGISTRATION NUMBER: 36,424
REFERENCE/DOCKET NUMBER: 5076
TELECOMMUNICATION INFORMATION:
TELEPHONE: (416) 863-434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX: (416) 863-261
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OPERATING SYSTEM: MS-D
SOFTWARE: WORD PERFECT
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRIOR APPLICATION DATA:
  443
                                                                                                                                                                  332
                                                                                                                                                                                                           343
                                                                                                                                                                                                                                                                                                                                      233
                                                                                                                                                                                                                                                                                                                                                                             228
                                                                                                                                                                                                                                                                                                                                                                                                                      174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             118 GILGKWSMLVLVGDMHRDMRSISLNFLSHARLR---TILLKDVERHTLFVLDSWQQ--NS 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: US/08/724,466B FILING DATE: October 1, 1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDIUM TYPE: Diskette, 3 1/2 inch, COMPUTER: COMPAQ, IBM PC compatible OPERATING SYSTEM: MS-DOS 5.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10 LPLLLLPSL----LSLLLFLILLK------RRNRKTRFNLPPGKSGWPFLGETIGYLK 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: amino acid
STRANDEDNESS: sir
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH:
                                      AGSELAKLEMAVFIHHLVLKFNWELAE-----DDQPFAFPFVDFP 502
                                                                                  WNVIYSICDTHDVAEIFTNKEEFNPDRFSAPHPEDASRFS
                                                                                                                                                                                                                                                                                                                                    LYRGMKARNLIHARIEQNIRAKICGLRASEAGQGCKDALQLLIEHSWE-----RGERL
                                                                                                                                                                                                                                                                                                                                                                        YHKALQSRATILKFIERKMEERKLDIKEED-----QEEEEVKTEDEAEMSKSDHVRKQRT 282
                                                                                                                                                                                                                                                                                                                                                                                                                      GLLVYPEVKRLMFRIAMRILLGCEPQLAGDGDSE-QQLVEAFEEMTRNLFSLPIDVPFSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TILGSGCLSNLHDSSHKQRKKVIMRAFSREALECYVPVITEEVGSS-----LEQWLSCGER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PYTATTLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIG 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LPALLASALCTFVLPLLLFLAAIKLWDLYCVSGRDRSCALPLPPGTMGFPFFGETL----
VGKEFAKILLKIFTVELARHCDWQLLNGPPTMKTSPTVYPVDNLP 487
                                                                                                                        WKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLC
                                                                                                                                                                  SKGLLCKSNQDNKLDMEILEQLKYIGCVIKETLRLNPPVPGGFRVALKTFELNGYQIPKG
                                                                                                                                                                                                        EIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSG
                                                                                                                                                                                                                                                    DMQ----ALKQS--STE------LLFGGHETTASAATSLITYLGLYPHVLQKVREELK
                                                                                                                                                                                                                                                                                        DDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHL 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                             IFSAQDEAKKFTFNLMAKHIMSMDP-----GEEETEQLKKEYVTFMKGVVSAPLNLPGTA 227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -QMVLQRRKFLQMKRRKYGFIYKTHLFGRPTVRVMGADNVRRILLGDDRLVSVHWPASVR 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         497 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (416)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          863-2653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16.4%; Score 439; DB 3; 27.0%; Pred. No. 2.2e-35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          08/667,546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      50767/00004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.4 Mb storage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 497;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                    ---FIPFGGGLRSC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                    331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        58
                                                                                    442
                                                                                                                        462
                                                                                                                                                                                                           402
                                                                                                                                                                                                                                                                                                                                                                                                                      232
                                                                                                                                                                  391
                                                                                                                                                                                                                                                                                                                                      285
```

15;

US-08-991-677-4 ; Sequence 4, Application US/08991677A ; Patent No. 6252135

RESULT

```
US-08-948-564-6
; Sequence 6, Application US/08948564
; Patent No. 6121512
                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; LENGTH: 511
; TYPE: PRT
; ORGANISM: Liquidambar styraciflua
US-08-991-677-4
                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                   뮻.
                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                     멂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE: PatentIn Ver. 2.0 SEQ ID NO 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches 121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Chiang, Vincent L
APPLICANT: Carraway, Daniel T
APPLICANT: Smeltzer, Richard H
TITLE OF INVENTION: Production of Syringyl Lignin in
FILE REFERENCE: 50617
CURRENT APPLICATION NUMBER: US/08/991,677A
CURRENT FILING DATE: 1997-12-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                             GENERAL INFORMATION:
APPLICANT: Simins:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EARLIER APPLICATION NUMBER: US 60/033,381 EARLIER FILING DATE: 1996-12-16 NUMBER OF SEQ ID NOS: 11
APPLICANT: Siminszky, Balazs
APPLICANT: Dewey, Ralph E.
APPLICANT: Corbin, Frederick T.
APPLICANT: No. 6121512el Cytochrome
                                                                                                                                                                                                                                           484 NWELAEDDQP 493
                                                                                                                                                                                                                                                                                                                                                                                                                                              304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6
                                                                                                                                                                                                                     TWELPDGMKP 479
                                                                                                                                                                                                                                                                                                                                NPWRWQQQNNGASSSGSGSFSTWGNN--YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF
                                                                                                                                                                                                                                                                                                                                                                                                       FTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLF
                                                                                                                                                                                                                                                                                                                                                                                                                                          MDVMFGGTETVASAIEWAMTELMKSPEDLKKVQQELAVVVGLDRRVEEK-----DFEKLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSKNSEEVDTDMVDDLLAFYGEEAKVSESDD-------LQNSIKLTKDNIKAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDQEEEEVKTE-------DEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OLFGAFNIADFIPWLKWVPQGINVRLN------KARGALDGFIDKIIDDH---IQK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QL-----KKEYVTFMKGV---VSAPLNLPGTAYHKALQSRATILKFIERKMEERKLDIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -SVRDEVDSAVRVVASNIGSTVNIGELVFALTKNITYRAAFGTISHEDQDEFVAILQEFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AKLAKQ----YGGLFHLKMGFLHMVAVSTPDMARQVLQVQDNIFSNRPATIAISYLTYDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HHTLLPL-LLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTL 64
                                                                                                                                                                                                                                                                                          RPSRFLK-----DGVPDFK--GNNFEFIPFGSGRRSCPGMQLGLYALETTVAHLLHCF
                                                                                                                                                                                                                                                                                                                                                                 YLKCVLKEVLRLHPPIPLLLHETAEDAEVGGYYIPAKSRVMINACAIGRDKNSWADPDTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMD 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AD-----MAFAHYGPFWRQMRKLCVMKLFSRKR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SIGGILGKWSMLVLVGDMHRDMRSIS-LNFLSHARLRTILLKDVERHTLFVLDSWQQNSI 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFE------CSYPR 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HEALQPLPMTLFFIIPLLLLLGLVSR--LRQRLPYPPGPKGLPVIGNML-MMDQLTHRGL 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ------AKKFTFNLMAKHIMSMDPGE-----EETE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 289; DB 4; 1
Pred. No. 2.3e-20;
5; Mismatches 196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----AESWE----
   P-450 Constructs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 511;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels 138;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gymnosperms
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      210
                                                                                                                                                                                                                                                                                            469
                                                                                                                                                                                                                                                                                                                                483
                                                                                                                                                                                                                                                                                                                                                                                                       425
                                                                                                                                                                                                                                                                                                                                                                                                                                            358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21;
```

```
밁
                                                                            밁
                                                                                                             Ş
                                                                                                                                                  밁
                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; MOLECULE TYPE: US-08-948-564-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEFAX: 919-854-1401
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET: PO DUA
CITY: Raleigh
STATE: No. 6121512th Carolina
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PATENTIN Release #1.0
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
LENGTH: 513 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
ADDRESSEE: Virginia C.
STREET: PO Box 37428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE: 919-854-1400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                               174
440 KMMPFGVGRRICPGLAMATVHIHLMMARMVQEFEW
                                                                                                                 392
                                                                                                                                                                                                                                                                                                       230
                                                                                                                                                                                                                                                                                                                                                                                                                 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               thes 118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     115 SIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVL-----DSW 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: ami
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE/DOCKET NUMBER: 37,092
LECOMMUNICATION INFORMATION TRELEPHONE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: FILING DATE: CLASSIFICATION: 800
                                                                                                                                                                                                                                                                                                                                                                                                                 QQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYGPV---WKSL-----RNMVQNMLSSTRLKE--FRSVRDNAMDKLINRLKDEAE 173
                                       NYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNW
                                                                                                                                                    NVQTKLYEE-----IKRTVGEKKVDEKDVEKMPYLHAVVKELLRKHPPTHFVLTHAVTE
                                                                                                                                                                                       KAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKD
                                                                                                                                                                                                                             ATTESYLDTLEDLKVEG----KKSAPSDAELVSLCSEFLNGGTDTTATAVEWGIAQLIANP
                                                                                                                                                                                                                                                                RKQRTDDDLL-----GWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACP
                                                                                                                                                                                                                                                                                                     PILSPFFSKQRKKALEVRREQVEFLVPIIEQRRRAIQNPG--
                                                                                                                                                                                                                                                                                                                                      PLNLP--GTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHV 277
                                                                                                                                                                                                                                                                                                                                                                             KNNGVVWVLKDARFAVFCILVAMCFGLEMDEETVERIDQ----VMKSVLITLDPRIDDYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RLKYGSIFTLKMGTRTMIILTDAKLVHEAMIQKGATYATRPPENPTRTIFSENKFTVNAA 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPR------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LAFFISGLIF--FLKQKSKSKKFNLPPGPPGWPIVGNLFQVARSGKPFF-----EYVNDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LPSILSLIFTILKRRNRKTRENLPPGKSGWPFLGETIGYL---KPYTATTLGDFMQQH 71
                                                                                                             -VRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGN
                                                                            PTTLGGYDIPIDANVEVYTPAIAEDPKNWLNPEKFDPERFISGGEEADITG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        919-854-1401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10.4%; Score 279.5; DB 3; ilarity 22.9%; Pred. No. 2.1e-19; Conservative 82; Mismatches 216;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Patentin Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Methods: 23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US/08/948,564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5051-409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of Producing Herbicide-Resistant Transgenic Plants
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Version
 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                  384
                                                                                                                                                                                       391
                                                                                                                                                                                                                             330
                                                                                                                                                                                                                                                                331
                                                                                                                                                                                                                                                                                                       273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  114
                                                                                                                                                                                                                                                                                                                                                                                                                 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17;
```

```
밁
                                                                                                                                                                                                                                                                                                          õ
                                                                                                                             Qγ
                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                         Š
                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-091-432-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-091-432-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 9.8%; Score 264;
Best Local Similarity 20.3%; Pred. No. 7.
Matches 109; Conservative 103; Mismatche
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OTHER INFORMATION: Sequence is deduced Patent No. 5981837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQ ID NO 2
LENGTH: 520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 2, Application US/09091432
Patent No. 5981837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION: A Method For Regulation Of Plant Lignin Composition FILE REFERENCE: 7024-325
CURRENT APPLICATION NUMBER: US/09/091,432
CURRENT FILING DATE: 1998-06-18
EARLIER APPLICATION NUMBER: PCT/US96/20094
EARLIER FILING DATE: 1996-12-19
EARLIER FILING DATE: 1996-12-19
EARLIER APPLICATION NUMBER: US 60/009,119
EARLIER APPLICATION NUMBER: US 60/013,388
EARLIER APPLICATION NUMBER: US 60/013,388
EARLIER FILING DATE: 1996-03-14
NUMBER: OF SEQ. ID NOS: 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: Microsoft Word 2.0C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: Chapple, Clint
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM: Artificial
436 ----PGVPDFKGSNFEFIPFGSGRRSCPGMQLGLYALDLAVAHILHCFTWKLPDGMKP 489
                                                                                                                                                                              324
                                                                                                                                                                                                                                                                       270
                                                                                                                                                                                                                                                                                                              269
                                                                                                                                                                                                                                                                                                                                                           218
                                                                                                                                                                                                                                                                                                                                                                                                       217
                                                                                                                                                                                                                                                                                                                                                                                                                                               159 VDKMVRSVSCNVGKPINVGEQIFALTRNITYRAAFGSACEKGQDEFIRILQEF-SKLFGA 217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11 PLLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQ 70
                                                                                                                                                                              VASAIEWALTELLRSPEDLKRVQQELAEVVGLDRRVEES-----DIEKLTYLKCTLKETL
                                                                                                                                                                                                                                                                  GDVVDTDMV-----DDLLAFYSEEAKLVSETADLQNSIKLTRDNIKAIIMDVMFGGTET
                                                                                                                                                                                                                                                                                                            AEMSKSDHVRKQRTDDDLLGWVLKHSNLSTE------QILDLILSLLFAGHET
                                                                                                                                                                                                                                                                                                                                                           FNVADFIPYFGWIDPQGINKRLVKARNDLDGFID-----DIIDEHMKKKENQNAVDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -AKKYGGLCHLRMGFLHMYAVSSPEVARQVLQVQDSVFSNRPATIAISYLTYDRAD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PTTSLVIVVSLFIFISFITRRRRPP---YPPGPRGWPIIGNML-MMDQLTHRGLANL---
                                         GASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQP 493
                                                                                                                                                                                                                      SSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETL 375
                                                                                                                                                                                                                                                                                                                                                                                                  VSAPLNLPGTAY -----HKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTE-DE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---MAFAHYGPFWRQMRKVCVMKVFSRKR-----AESWA-----SVRDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKWSMLVLVGDMHRDMRSIS-LNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFE-----CSYPRSIGGIL
                                                                                        RMHPPIPLLLHETAEDTSIDGFFIPKKSRVMINAFAIGRDPTSWTDPDTFRPSRFLE---
                                                                                                                             RLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNN 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   from DNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 2;
7.6e-18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NO:1
                                                                                                                                                                                                                                                                                                              315
                                                                                                                                                                                                                                                                                                                                                           269
                                                                                                                                                                                                                                                                                                                                                                                                     268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18;
```

RESULT 8 US-08-457-274A-25

```
QΥ
                                     B
                                                                      ρ
                                                                                                                В
                                                                                                                                                 QУ
                                                                                                                                                                                      밁
                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-457-274A-25
                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 9.8%; Score 263.5; DB 1 Best Local Similarity 24.1%; Pred. No. 8.1e-18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 25, Application US/08457274A Patent No. 5734086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAMME: GOLdman, Michael L.
REGISTRATION NUMBER: 30,727
REFERENCE/DOCKET NUMBER: 1966
TELECOMMUNICATION INFORMATION:
TELEPHONE: 716-263-1304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX: 716-263-1600 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: amino acid
STRANDEDNESS: sing
TOPOLOGY: linear
MOLECULE TYPE: prote
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEVELOPMENTAL STAGE:
POSITION IN GENOME:
CHROMOSOME/SEGMENT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HYPOTHETICAL:
ANTI-SENSE: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION:
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Scott, Jeffrey G. APPLICANT: Tomita, Takashi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                                                                                                                                                                                        111 VGIMGKAVSVAKDEEWKRYRALLSPTFTS-GRLKE-MFPIIEQYGDILVKYLKQEAETGK 168
                                                                                                                                                                                                                            118 -GILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNS----
 275 DHVRKQRTDDDLLGWVL----
                                       229 LTP---IXEMLNICMFPKDSIEFFKKFVYR-MKETRL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET: P.O. BO:
CITY: Rochester
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                 58 WKFDVECHKKYGKIW--GLFDGQMPLFAITDTEMIKNVL----VKECFSVFTNRRDFGP
                                                                                                                                                                                                                                                                                                  65 GDFMQQHVSKYGKIYRSNLF-GE-PTIVSADAGLNRFILQNEGRLFEC----SYPRSIG- 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                      3 LLSALTLETWYLLAVYLVLLYGFGTRTHGLFKKQGIPGPKPLPFFGTVLNYY-----MGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH:
                                                                                                                                                                                                                                                                                                                                                                             9 LLPLLLLPSLLSLLLFLILLKRRNRKTR--FNLP--PGKSGWPFLGETIGYLKPYTATTL
                                                                                                                PVTMKKVFGAYSMDVITSTSFGVNVDSLNNPKDPFVEKTKKLLRFDFFDPLFLSVVLFPF
                                                                                                                                                   ----IFSA--QDEAKKFTFNLMAKHIMS-MDPGEEETEQLKK--EYVTFMKGVVSAPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E: Nixon, Hargrave, Devans & Doyle P.O. Box 1051, Clinton Square
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           504 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Takashi
Cytochrome P4501pr Gene and Its Uses
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US/08/457,274A
                                                                          -QSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Adult
                                                                                                                                                                                                                                                                                                                                                                                                                 89; Mismatches 213;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             19603/240 (D-1519)
-KHSNLSTEQILDLILSLLFAGHETSSVAIALAI 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 504;
                                                                                                                                                                                                                                                                                                                                                                                                                   Indels 113;
                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                          274
                                                                                                                                                                                                                              172
                                                                                                                                                                                                                                                                 110
                                                                                                                228
                                                                                                                                                                                                                                                                                                                                            57
                                                                                                                                                                                                                                                                                                                                                                               64
```

25;

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ̈́ο
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                  PCT-US95-05758-25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 9
PCT-US95-05758-25
                   Query Match
Best Local Similarity
Matches 132; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 25, Application PC/TUS9505758 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: 716-263-1600 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                              MOLECULE TYPE: PHYPOTHETICAL: NO ANTI-SENSE: NO ORIGINAL SOURCE:
                                                                                                                                                   DEVELOPMENTAL STAGE: POSITION IN GENOME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Goldman, Michael L
REGISTRATION NUMBER: 30,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SOFTWARE: Patentin Rel CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
COMPUTER: IBM PC com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: Cyto
                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
LENGTH: 504 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                           TELECOMMUNICATION INFORMATION: TELEPHONE: 716-263-1304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      474 IPLKLSR 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: PCT/US95/05758 FILING DATE:
                                                                                                                                   CHROMOSOME/SEGMENT:
                                                                                                                                                                                           STRAIN: Unknown
                                                                                                                                                                                                              ORGANISM:
                                                                                                                                                                                                                                                                                                           TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET:
                                                                                                                                                                                                                                                                                                                         STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DSVQKHRV--DFLQLMMNAHNDSKDKESHTALSDMEITAQSIIFIFAGYEPTSSTLSFVL 319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFL 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----YVYLPFGNGPRNCIGMRFALMNMKLALTKVLQNFSFQPCKETQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNG 504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ERVCKKDVEINGVFMPKGSVVMIPSYALHRDPQHWPEPEEFRPERFSKENKGSIDP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         HRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGS 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HSLATHPDTQKKLQE---EIDRALP--NKAPPTYDTVMEMEYLDMVLNETLRLYPIGNRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rochester
                                                                                                                                                                                                                                                                                                                                              amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E: Nixon, Hargrave, Devans & Doyle P.O. Box 1051, Clinton Square
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cornell Research Foundation, Inc. VENTION: Cytochrome P4501pr Gene and
                     Conservative
                                                                                                                                                                                                              Rat
                                                                                                                                                                                                                                                                                                           linear
                                                                                                                                                                                                                                                                  : protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Floppy disk
                                                                                                                                                                                                                                                                                                                           single
                 9.8%; Score 263.5; DB 5; 24.1%; Pred. No. 8.1e-18; Live 89; Mismatches 213;
                                                                                                                                 Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30,727
                                                                                                                                                                         Adult
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19603/241 (D-1519)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Its
                     Indels
                                                     Length 504;
                   113;
                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    430
                   25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 10
US-08-313-075A-30
; Sequence 30, App
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
APPLICANT: Holton, Timothy A.
APPLICANT: Cornish, Edwina C.
APPLICANT: Tanaka, Yoshikazu
TITLE OF INVENTION: GENETIC SEQUENCES ENCODING FLAVONOID
TITLE OF INVENTION: PATHWAY ENZYMES AND USES THEREFOR
                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                    APPLICATION NUMBER: L
FILING DATE: 30-NOV-1
CLASSIFICATION: 800
PRIOR APPLICATION DATA:
PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                                 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    474 IPLKLSR 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     505 LPIRVSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              111 VGIMGKAVSVAKDEEWKRYRALLSPTFTS-GRLKE-MFPIIEQYGDILVKYLKQEAETGK 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     118
                                                                                                                                                                   OPERATING SYSTEM:
SOFTWARE: PatentI
                                                                                                                                                                                                                                                                   STATE: New York COUNTRY: U.S.A. ZIP: 11530
                                                                                                                                                                                                                                                                                                                         STREET: 400 Garden City
                                   APPLICATION NUMBER: AU PIFILING DATE: 27-MAR-1992
                                                                                                                                                                                                          COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGS 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DSVQKHRV--DFLQLMMNAHNDSKDKESHTALSDMEITAQSIIFIFAGYEPTSSTLSFVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DHVRKQRTDDDLLGWVL-----KHSNLSTEQILDLILSLLFAGHETSSVAIALAI 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LTP---IYEMLNICMFPKDSIEFFKKFVYR-MKETRL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NLPGTAYHKAL-----QSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKS 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PVTMKKVFGAYSMDVITSTSFGVNVDSLNNPKDPFVEKTKKLLRFDFFDPLFLSVVLFPF 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----IFSA--QDEAKKFTFNLMAKHIMS-MDPGEEETEQLKK--EYVTFMKGVVSAPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WKFDVECHKKYGKIW--GLFDGQMPLFAITDTEMIKNVL----VKECFSVFTNRRDFGP 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDFMQQHVSKYGKIYRSNLF-GE-PTIVSADAGLNRFILQNEGRLFEC----SYPRSIG- 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ERVCKKDVEINGVFMPKGSVVMIPSYALHRDPQHWPEPEEFRPERFSKENKGSIDP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HSLATHPDTQKKLQE---EIDRALP--NKAPPTYDTVMEMEYLDMVLNETLRLYPIGNRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LLSALTLETWVLLAVVLVLLYGFGTRTHGLFKKQGIPGPKPLPFFGTVLNYY-----MGL 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LLPLLLLPSLLSLLLFLILLKRRNRKTR--FNLP--PGKSGWPFLGETIGYLKPYTATTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----YVYLPFGNGPRNCIGMRFALMNMKLALTKVLQNFSFQPCKETQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -GILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNS---- 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5639870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Application US/08313075A
                                                                                                                                                                                                                                                                                                                                          E: Scully, Scott, Murphy & Presser
                                                                                                                                                                     PatentIn Release #1.0,
                                                                                                                                                                                                        E: Floppy disk
IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       511
                                                                                                              30-NOV-1994
                                                                                                                                                                                         PC-DOS/MS-DOS
                                                       AU PL 1538/92
                                                                                                                                 US/08/313,075A
AU PL 6698/93
                                                                                                                                                                       Version #1.25
```

384 319

473

430

221

```
Вb
                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; MOLECULE TYPE: protein US-08-313-075A-30
                                                                                                                                                  RESULT 11
US-08-201-118-7
                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                 Ω
                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity Matches 123; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       •Query Match
Best Local
                                                                                                                 Sequence 7, Application US/08201118 Patent No. 5786191
                 GENERAL INFORMATION:
APPLICANT: GOLDSTEIN, JOYCE A.
APPLICANT: ROMKES-SPARKS, Marjorie
TITLE OF INVENTION: CLONING AND EXPRESSION OF
TITLE OF INVENTION: DNAS FOR MULTIPLE MEMBERS
TITLE OF INVENTION: SUBFAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: (516) 742-4366
TELEX: 230 901 SANS UR
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
LENGTH: 476 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: AU POFILING DATE: 25-MAR-1993
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE: 07-JAN-1993 PRIOR APPLICATION DATA:
   NUMBER OF
                                                                                                                                                                                                                                                                                                                    406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                     441
                                                                                                                                                                                                                                                    464
                                                                                                                                                                                                                                                                                   391
                                                                                                                                                                                                                                                                                                                                                     336
                                                                                                                                                                                                                                                                                                                                                                                    347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     130
                                                                                                                                                                                                                                                                                                                                                                                                                                                      294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     234
                                                                                                                                                                                                                                                                                                                                                                                                                 276 KEEGDLQLPITNDNIKAIFNDMFAAGTETSSTTINWAMVELMKNPSVFAKAQAEVREVFK 335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12 LLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REGISTRATION NUMBER: 31,346
REFERENCE/DOCKET NUMBER: 9433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME: DiGiglio, Frank
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                    GISFGLANVYHPLAQLLYHFDWRLPTGVDPNDF
                                                                                                                                                                                                                                               GSELAKLEMAVFIHHLVLKFNWELAEDDQPFAF 496
                                                                                                                                                                                                                                                                                                                 LPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNN--YMPFGGGPRLCA 463
                                                                                                                                                                                                                                                                                                                                                  GKETFDE - - - - - DDIEELNYLKLVIRETLRLHPPLPLLLPRECRRETEINGYTIPLNTKV
                                                                                                                                                                                                                                                                                                                                                                                                                                      SN-----LSTEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIAR 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---GDMHRDMRSIS-LNFLSHARLRTILLKDVERHTLFVLDSWQQNS-----IFS 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSY-PRSIGGILGKWSMLVLV- 129
                                                                                                                                                                                                                                                                                   IVNVWAIGRDPKYWDDAESFKPERFEH------NSLNFAGNNFEYLPFGSGRRICP 440
                                                                                                                                                                                                                                                                                                                                                                                 AKKELGESELNWDDYKKMDFTQCVINETLRL-GNVVRFLHRKALKDVRYKGYDIPSGWKV 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MKGKIMD-VHRKV-----DAIVEEVMNEHK-ETLRTGKTNGEVGGEDLIDVLLRL 275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKH 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AQDEAKKFTFNLMAKHIMSMDPGE-EETEQLKKEYVTFMKGVVSAPLNLPGTAY-HKALQ 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SPYGDYWRQMRKICVLEVLSAKNVRS--FNSIRRDEILLMIDFLRSSSGKPVNITERIFS 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AKKYGPIMHLQLGKISAVVVTSPEMARKVLKTHDLAF--AYRPKLLGIEIVCYNSSDIAF 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LLIVFSLISLRKW----KKSNCQTK-KLPPGPWKVPFLGSLLHMVGGLPHHVLRDL---- 59
   SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      : (516) 742-4343
(516) 742-4366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FTSSMICRSVFGKRIKEKDECIRHVKKMTGLIDGFDVADI-FPSLRFLHVLIG 227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AU PCT/AU93/00127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  87; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 257; DB 1; Length 476; Pred. No. 3.3e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     227;
                                COMPLEMENTARY
OF THE HUMAN CYTOCHROME P450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     21;
                                  20
                                                              Qy
                                                                                                                                                                                               γ
                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
δÃ
                                  DЬ
                                                                                                DЬ
                                                                                                                               QΥ
                                                                                                                                                                В
                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                   111
 441
                                  363
                                                                 382
                                                                                                                                 324
                                                                                                                                                                  270
                                                                                                                                                                                                  264
                                                                                                                                                                                                                                 211
                                                                                                                                                                                                                                                                                                   171
                                                                                                                                                                                                                                                                                                                                  166
                                                                                                                                                                                                                                                                                                                                                                                                  124
                                                                                                                                                                                                                                                                                                                                                                                                                                   56
GSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED 490
```

```
; TOPOLOGY: 1:
; MOLECULE TYPE:
US-08-201-118-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 9.6%; Score 256.5; DB 1; Best Local Similarity 20.8%; Pred. No. 3.9e-17; Matches 110; Conservative 99; Mismatches 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEFAX: (415) 326-24 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE: 435
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 07/864,962
APPLICATION NUMBER: 09-APR-1992
APPLICATION DATE: 09-APR-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11 PLLLLPSLLSLLFLILLKRRNRKTRFNLPPGKSGWPFLGETI-----GYLKPYTATTLG 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME: Liebeschuetz, Joe
REGISTRATION NUMBER: 37,
REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STREET: 379 Lyt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3 PFVVLVLCLSFMLLFSLWRQSCRRKK--LPPGPTPLPIIGNMLQIDVKDICKSFT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DFMQQHVSK-YGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGK-W 123
                                                                                                                                                                                                                                      KTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALA 323
                                                                                                                                                                                                                                                                                                                                                                                       GCAPCNVICSVVFQ-KRFDYK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GIISSNGKRWKEIRRFSLINLRNFGMGKRSIEDRVQEEAHCLVEELRKTKASPCDPTFIL 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SMLVLVGDMHRDMRSISLNFLSHARLRTILLKD---VERHTL-----FVL 165
                                                                                                                                         IFFLOACPKAVEELREE--HLEIARAKKELGESELNWDDYKKMDFTOCVINETLRLGNVV 381
                                                                                                                                                                                           KMEQEKDNQKSE-----
                                                                                                                                                                                                                                                                                       PWIQVCNNFPLLIDCFPGT-HNKVLKNVALTRSYIREKVKEHQASLDVNNPRDFMDCFLI 269
                                                                                                                                                                                                                                                                                                                                                                                                                                     DSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMK-----GVVSA 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----NFSKVYGPVFTVYFGMNPIVVFHGYEAVKEALIDNGEEFSGRGNSPISQRITKGL 110
PTGVPHAVTTDTKFRNYLIPKGTTIMALLTSVLHDDKEFPNPNIFDPGHFLDKN-----
                                                                                           LLLLLKHPEVTAKVQEEIDHV-IGRHRSPC-----MQDRSHMPYTDAVVHEIQRYSDLV 362
                                                                                                                                                                                                                                                                                                                                       PL-----NLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEE----V 263
                                        -RFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSS 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    H: 490 amino acids
amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           379 Lytton Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (415)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (415) 326-2400
(415) 326-2422
)R SEQ ID NO: 7:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Townsend and Townsend Khourie and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US/08/201,118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15280-192-1
                                                                                                                                                                                           -----FNIENLVGTVADLFVAGTETTSTTLRYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Version
                                                                                                                                                                                                                                                                                                                                                                                       ------DQNFLTLMKRFNENFRILNS 210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Crew
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 490;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
```

20;

```
2
                                                                                                                                                                               Q
10
                                                         밁
                                                                                                                                           밁
                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                      ; TOPOLOGY: linear; MOLECULE TYPE: protein US-08-238-821B-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-238-821B-7
                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                  Matches 110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 7, Application US/08238821B Patent No. 5912120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: US 07/864,962
FILLING DATE: 09-APR-1992
ATTORNEY/AGENT INFORMATION:
NAME: L1ebeschuetz, Joe
REGISTRATION NUMBER: 37,505
REFERENCE/DOCKET NUMBER: 15280-1921
TELECOMMUNICATION INFORMATION:
TELEPHONE: (560) 326-2400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX: (650) 326-2422 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: GOLDSTEIN, JOYCE A.
APPLICANT: ROMKES-SPAKKS, MAIJORIE
APPLICANT: DE MORAIS, SON1A M.F.
TITLE OF INVENTION: CLONING, EXPRESSION AND DIAGNOSIS OF HUMAN
TITLE OF INVENTION: CYTOCHROME P450 2C19: THE PRINCIPAL DETERMINANT OF
TITLE OF INVENTION: MEPHENYTOIN METABOLISM
NUMBER OF SEQUENCES: 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS:
LENGTH: 490 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: US 08
FILING DATE: 22-FEB-1994
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION DATA:
PRIOR APPLICATION NUMBER: US 08/201,118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
             166 DSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMK-----GVVSA 219
                                                       111 GIISSNGKRWKEIRRESLTNLRNEGMGKRSIEDRVQEEAHCLVEELRKTKASPCDPTFIL 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       417 -- GNFKK-SDYFMPFSAGKRICAGEGLARMELFLFLTTILQNFNLKSVDD
                                                                                                                                              56
                                                                                                                                                                                 66 DFMQQHVSK-YGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGK-W 123
                                                                                                                                                                                                                                                                   11 PLLLLPSLLSLLLFLILLKRRNRKTRENLPPGKSGWPFLGETI-----GYLKPYTATTLG 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: US/0 FILING DATE: 06-MAY-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE:
                                                                                                                                       ----NFSKVYGPVFTVYFGMNPIVVFHGYEAVKEALIDNGEEFSGRGNSPISQRITKGL 110
                                                                                                                                                                                                                              PFVVLVLCLSFMLLFSLWRQSCRRRK--LPPGPTPLPIIGNMLQIDVKDICKSFT----- 55
                                                                                               SMLVLVGDMHRDMRSISLNFLSHARLRTILLKD---VERHTL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      San Francisco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            490 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          E: Townsend and Townsend and Crew LLP Two Embarcadero Center, 8th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ະຣຣ: single
linear
                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                               9.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US/08/238,821B
                                                                                                                                                                                                                                                                                                                99;
                                                                                                                                                                                                                                                                                                                                  Score 256.5;
Pred. No. 3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5280-192110US
                                                                                                                                                                                                                                                                                                                Mismatches 202;
                                                                                                                                                                                                                                                                                                                                  5; DB 2;
3.9e-17;
                                                                                                                                                                                                                                                                                                                                                      Length 490;
                                                                                                                                                                                                                                                                                                              Indels 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            463
                                                                                                 ----FVL 165
                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                              20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 13
PCT-US95-05744-7
; Sequence 7, Application PC/TUS9505744
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                   TELEFAX: (415) 326-2422 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: ROMKES-SPARKS, Marjorie
APPLICANT: DE MORAIS, SONIA M.F.
TITLE OF INVENTION: CLONING, EXPRESSION AND DIAGNOSIS OF HUMAN
TITLE OF INVENTION: CYTOCHROME P450 2C19: THE PRINCIPAL DETERMINANT
TITLE OF INVENTION: OF S-MEPHYNYTOIN METABOLISM
NUMBER OF SEQUENCES: 61
                                                                                                                                                                           REGISTRATION NUMBER: 29,684
REFERENCE/DOCKET NUMBER: 15
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: US 0 FILING DATE: 22-FEB-1994 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/238,821
FILING DATE: 06-MAY-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOTTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                  APPLICATION NUMBER: US 07/864,962
FILING DATE: 09-APR-1992
ATTORNEY/AGENT INFORMATION:
NAME: Dow, Karen B.
                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE: 06-MAY-
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE: Townsend
                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    441 GSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED 490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             220 PL------NLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEE----V 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       171 GCAPCNVICSVVFQ-KRFDYK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              363 PTGVPHAVTTDTKFRNYLIPKGTTIMALLTSVLHDDKEFPNPNIFDPGHFLDKN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        264 KTEDEAEMSKSDHYRKQRTDDDLLGWYLKHSNLSTEQILDLILSLLFAGHETSSYAIALA 323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: Palo Alto
STATE: California
                                                                                                                                                           TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET:
                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --GNFKK-SDYFMPFSAGKRICAGEGLARMELFLFLTTILQNFNLKSVDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -RFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSS 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LLLLLKHPEVTAKVQEEIDHV-IGRHRSPC-----MQDRSHMPYTDAVVHEIQRYSDLV 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IFFLQACPKAVEELREE--HLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVV 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KMEQEKDNQKSE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PWIQVCNNFPLLIDCFPGT-HNKVLKNVALTRSYIREKVKEHQASLDVNNPRDFMDCFLI 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94301
                                                     amino acid
                                                                                                                                                                                                                                           Dow, Karen B
                                                                         490 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               379 Lytton Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Townsend and Townsend Khourie and Crew
                                                                                                                                                             (415)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Floppy disk
                               single
                                                                                                                                                           326-2400
                                                                                                                                                                                                                                                                                                                                                                            US 08/201,118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PCT/US95/05744
                                                                                                                                                                                                       15280-192-1-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----FNIENLVGTVADLFVAGTETTSTTLRYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---DQNFLTLMKRFNENFRILNS 210
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ٠ ٥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 14
US-08-532-065B-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CT-US95-05744-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 2, Application US/08532065B Patent No. 5753507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches 110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 9.6%;
Best Local Similarity 20.8%;
                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/532,065B
FILING DATE: 22-SEP-1995
CLASSIFICATION: 800
                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
APPLICANT: Ohta, Daisaku
APPLICANT: Mizutani, Masaharu
APPLICANT: Mizutani, Masaharu
TITLE OF INVENTION: Plant Geraniol/Nerol 10-Hydroxylase and
TITLE OF INVENTION: DNA Coding Therefor
                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
CORRESPONDENCE ADDRESS
               ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          211 PWIQVCNNFPLLIDCFPGT-HNKVLKNVALTRSYIREKVKEHQASLDVNNPRDFMDCFLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   66
                                                                                                                                                                                                                                                     STREET: 59 Route 1
CITY: East Hanover
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11 PLLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETI-----GYLKPYTATTLG 65
                                                                                                                                                                                                                   COUNTRY:
                                                                                                                                                                                                                                         STATE:
                                                                                                                                                                                                       ZIP: 07936
                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMK-----GVVSA 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GIISSNGKRWKEIRRFSLTNLRNFGMGKRSIEDRVQEEAHCLVEELRKTKASPCDPTFIL 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IFFLOACPKAVEELREE--HLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVV 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SMLVLVGDMHRDMRSISLNFLSHARLRTILLKD---VERHTL-----FVL 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DFMQQHVSK-YGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGK-W 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PFVVLVLCLSFMLLFSLWRQSCRRRK--LPPGPTPLPIIGNMLQIDVKDICKSFT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --GNFKK-SDYFMPFSAGKRICAGEGLARMELFLFLTTILQNFNLKSVDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----NFSKVYGPVFTVYFGMNPIVVFHGYEAVKEALIDNGEEFSGRGNSPISQRITKGL 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PTGVPHAVTTDTKFRNYLIPKGTTIMALLTSVLHDDKEFPNPNIFDPGHFLDKN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -RFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LLLLLKHPEVTAKVQEEIDHV-IGRHRSPC-----MQDRSHMPYTDAVVHEIQRYSDLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KMEQEKDNQKSE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PL-----NLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEE----V
                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                          59 Route 10
                                                                                                                                                                                                                      USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                           No. 5753507artis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein
Timothy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99; Mismatches 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 256.5; DB 5
Pred. No. 3.9e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----FNIENLVGTVADLFVAGTETTSTTLRYG
                                                                                                                                                                                                                                                                                           Corporation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 490;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20;
```

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                 US-08-948-564-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-08-532-065B-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REGISTRATION NUMBER: 38,241
TELECOMMUNICATION INFORMATION:
TELEPHONE: 919-541-8587
TELEFAX: 919-541-8689
INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
LENGTH: 495 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                  Sequence 16, Application Patent No. 6121512
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local :
STREET: PO CONTY: Raleigh
CITY: Raleigh
STATE: NO. 6121512th Carolina
COUNTRY: USA
ZIP: 27627
ZIP: 27627
                                                                                                                                                                                  APPLICANT: Siminszky, Balazs
APPLICANT: Dewey, Ralph E.
APPLICANT: Corbin, Frederick T.
TITLE OF INVENTION: No. 6121512el Cytochrome P-450 Constructs and
TITLE OF INVENTION: Methods of Producing Herbicide-Resistant Transgenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY: 1i
                                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                y Match 9.1%; Score 245; DB 1; I
Local Similarity 22.9%; Pred. No. 5.6e-16;
hes 120; Conservative 80; Mismatches 218;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12 LLLLPSLLS-LLLFLILLKRRNRKTRFNLPPGKSGWPFLGETTIGYLKPYTATTLGDFMQQ 70
                                                                                                                                                   ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KAVEELREEHLEIARAKKE----LGESEL-NWDDYKKMDFTQCVINETLRLGNVVRFL-H 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DVRGRDYELTPFGAGRRICPGMPLAMKTVSLMLASLLYSFDWKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STWGNNY--MPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWEL 487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RKAESDAEILGFMVLKDTQVLVNVWAIGRDPSVWDNPSQFEPERFLGKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KT-----MAKAQAEIDCVIGQNGIVEESDISKLPYLQAVVKETFRLHTPVPLLIP 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKNDFV-----DNLLDYKGDESELSISDIEHLLLDMFTAGTDTSSSTLEWPMTELLKNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFAGHETSSVAIALAIFFLQACP 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FPFLRFLDLQGNVKTFKVCTERLVRVFRGFIDAKIAEKSSQNNPKD------V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---AYHKALQSRATILK------FIERKMEERKLDIKEEDQEEEEVKTEDEAEM 271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SVDISRVAFITTLNIISNILFSVDLGSYNA----KASINGVQDTVISVMDAAGTPDAANY 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSSSARWRLL------RRLSVTQLLSPQRIEATKALRMNKVKELVSFISESSDREE 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYP----RSIG------ 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LLLFCFILSCFLIFTTTRSGRISRGATALPPGPPRLPIIG-NIHLVGKHPHRSFAELSK- 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQQQNNGASSSGSGSF 445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -GILGKWSMLVLVGDMHRDMRSISL-NFLSHARL---RTILLKDVERHTLFVLDSWQQNS 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---TYGPVMSLKLGSLNTVVIASPEAAREVLRTHDQILSARSPTNAVRSINHQDASLVWL 124
                                                                                                                                                                                                                                                                                                                                          6, Application US/08948564 6121512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                               Virginia C. Bennett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 495;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---M 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19;
```

```
맑
                                    Ş
                                                                                    밁
                                                                                                                         Š
                                                                                                                                                                       멍
                                                                                                                                                                                                              ŝ
                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                δ.
                                                                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; MOLECULE TYPE: protein US-08-948-564-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEFAX: 919-854-1401
INFORMATION FOR SEQ ID NO: 16:
SEQUENCE CHARACTERISTICS:
LENGTH: 576 amino acids
TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 9.1%; Score 244.5; DB 3; Best Local Similarity 22.7%; Pred. No. 7.9e-16; Matches 111; Conservative 91; Mismatches 181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION: 800
ATTORNEY/AGENT INFORMATION:
NAME: Bennett, Virginia C.
REGISTRATION NUMBER: 37,092
REFERENCE/DOCKET NUMBER: 5051-409
TELECOMMUNICATION INFORMATION:
TELEPHONE: 919-854-1400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/948,564
                                                                                                                                                                                                                                                                                                                                                117 GGILGK------WSM--LVLVGDMHRDMRSISLNELSHARLRTILL--KDVERHTLF 163
535 MLLQNFDVEL 544
                                         478 HLVLKFNWEL 487
                                                                                    481 EEIEG-----WAGLDPSRSPGALYPNEVISDFAFLPFGGGPRKCVGDQFALMESTVALT 534
                                                                                                                                                                           423
                                                                                                                                                                                                       387 KALK-DV------RYKGYDIPSGWKVLPVISAVHLDNSRY--DQPNLFNPWRWQQQNNG 436
                                                                                                                                                                                                                                                              369 LAQNPSKMKKAQ-----AEVDLVLGTGRPTFESLKELQYIRLIVVEALRLYPQPPLLIR 422
                                                                                                                                                                                                                                                                                                         327
                                                                                                                                                                                                                                                                                                                                                                                                                                       264 YIP---YWKIPLARWIVPR--QRKFQD---DLKVINTCLDGLIRNAKESRQETDVE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                222 NLPGTAYHKALQSRATILKFIERKMEERKLDIK------EEDQEEEEVKTEDE 268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            208 GPDSIE----LDLEAEFSSLALDIIGLGVFNYDFGSVTKESPVIKAVYGTLFEAEHRSTF 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     164 VLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGE--EETEQLKKEYVTFMKGVVSAPL 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 150 -- IMGKGLIPADLDTWKQRRRVIAPAFHNSYLEAMVKIFTTCSERTILKFNKLLEGEGYD 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   97 SLYDWFLEH----GAVYKLAFGPKAFVVVSDPIVARHILRENAFSYDKGVLADILEP--- 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               63 TLGDFMQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQ-----NEGRLFECSYPRSI 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE:
                                                                                                                                                                                                                                                                                     LQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVINETLRLGNVVRFLHR 386
                                                                                                                             ASSSGSGSFSTWGN-----
                                                                                                                                                                         RSLKSDVLPGGHKGEKDGYAIPAGTDVF--ISVYNLHRSPYFWDRPDDFEPERFLVQNKN 480
                                                                                                                ---NYMPFGGGPRLCAGSELAKLEMAVFIH 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 576;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels 107; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                       311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          22;
```

Search completed: September 28, 2001, 18:44:39 Job time: 69 sec

```
Result.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Total number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Run on:
                                                                                                                                                                                                                                                                                                                        Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                       2681
978.5
978.5
978.5
978.5
978.5
978.5
946
                                                                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      seq length:
seq length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hits satisfying chosen parameters:
   100.0
36.5
36.5
36.5
36.5
36.5
37.3
37.3
27.1
27.1
                                                                                                                                                                                                                               Match
                                                                                                                                                                                                                                                 Query
                                                                                                                                                                                                                                                                                                                                                                                                   10:
11:
12:
13:
14:
15:
16:
17:
18:
19:
20:
21:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A_Geneseq_0601:*

1. /SIDSB/gcgdata/geneseq/geneseqp/AA1980.DAT:*
2: /SIDSB/gcgdata/geneseq/geneseqp/AA1981.DAT:*
3: /SIDSB/gcgdata/geneseq/geneseqp/AA1982.DAT:*
4: /SIDSB/gcgdata/geneseq/geneseqp/AA1983.DAT:*
5: /SIDSB/gcgdata/geneseq/geneseqp/AA1984.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-502-426-2
2681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   412676 seqs, 60623988 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 September 28, 2001, 18:43:30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                             SIDSB/gcgdata/geneseq/geneseqp/AA1990.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1991.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1991.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1992.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1993.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1994.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1995.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1995.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1997.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1999.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA1999.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA2000.DAT:*
/SIDSB/gcgdata/geneseq/geneseqp/AA2001.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MFETEHHTLLPLLLLPSLLS......FAFPFVDFPNGLPIRVSRIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /SIDS8/gcgdata/geneseq/geneseqp/AA1986.DAT:*
/SIDS8/gcgdata/geneseq/geneseqp/AA1987.DAT:*
/SIDS8/gcgdata/geneseq/geneseqp/AA1988.DAT:*
/SIDS8/gcgdata/geneseq/geneseqp/AA1989.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'SIDS8/gcgdata/geneseq/geneseqp/AA1985.DAT:*
                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2000000000
                                                         472
491
492
444
444
                                                                                                                                                                                                                                 ВB
                                                                                                                                                                                                                                 IJ
 AAB07921

AAW27153

AAG44571

AAG445022

AAG45021

AAG44570

AAG44572

AAG44572

AAG46490

AAG46491
                                                                                                                                                                                                                                                                                       SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Search time 22.2 Seconds (without alignments) 1400.906 Million cell updates/sec
A cytochrome P450
Arabidopsis thalia
                                                                                                                                                                                                                             Description
```

7232555550000000000000000000000000000000	22222222222222222222222222222222222222
461 461 439 411.5 411.5 411.5 318 318 318 318 318 318 298.5 298.5 298.5 298.5 298.5 297 297 290.5	712 712 653.5 606 606 603 598.5 547.5 528.5 528.5 528.5
17. 2 16.4 15.3 15.3 11.0 11.0 11.1 11.1 10.8 10.8	
497 497 253 253 519 905 500 510 510 510 511 511	4465 4466 4469 4469 4499 4499 4499
21 21 21 21 21 21 21 21 21 21 21 21 21 2	21 22 22 22 22 22 22 22 22 22 22 22 22 2
AAW37/35 AAW44161 AAW37734 AAW44160 AAG17903 AAG17903 AAG17904 AAG16752 AAG16752 AAG16753 AAG1675 A	AAG11836 AAG11835 AAG11834 AAG20783 AAG23013 AAG23014 AAG30048 AAG30049 AAG30049 AAG30049 AAG30049 AAG30049 AAG30049 AAG30049 AAG30049 AAG30050
Mouse retinoid met Human cytochrome P Human retinoid met Arabidopsis thalia Arabidopsis t	Arabidopsis thalia

## ALIGNMENTS

AAB07921

AAB07921 standard; Protein;

513

ð

14-NOV-2000

(first entry)

AAB07921;

New isolated dwf4 polynucleotide useful for altering the phenotype of plants, for diagnostic assays and in the production of antibodies -WPI; 2000-549142/50. N-PSDB; AAA59599. WO200047715-A2. Arabidopsis sp. DWF4; cytochrome P450 enzyme; brassinosteroid; 22alpha-hydroxylation; plant phenotype; cell elongation. A cytochrome P450 enzyme designated Azpiroz R, 11-FEB-1999; 11-FEB-1999; 11-FEB-2000; 2000WO-US03820 17-AUG-2000 (ARIZ-) ARIZONA BOARD OF REGENTS Choe S, 99US-0119657 99US-0119658 Feldmann KA DWF4

```
ARESULT
AAW271:
ID AJ
XX AG AJ
XX TI
AG AJ
XX AJ
DT 1:
DT 1:
XX AJ
XX AJ
XX AJ
XX CJ
XX AJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δō
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present sequence represents a DWF4 polypeptide. The polypeptide is cytochrome P450 enzyme that mediates multiple steps in synthesis of brassinosteroids. Specifically, it mediates multiple 22alpha-hydroxylation steps in brassinosteroid biosynthesis. The DWF4 polynucleotide is used for altering the phenotype of a plant. DWF4 plants display a dramatic reduction in the length of different organs, and this size reduction is attributable to a defect in cell elongation. The DWF4 polynucleotides and polypeptides can be used in diagnostic assays and to generate antibodies which can be used in diagnostic
                                                                                                          Cytochrome P450-type hydroxylase; id brassinosteroid inhibitor; modified
                                         Arabidopsis thaliana
                                                                                                                                                                                         Arabidopsis thaliana cytochrome P450-type hydroxylase
                                                                                                                                                                                                                                             14-APR-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   assays and to generate antibodies, which can be used to produce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              immunogenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Match 100.0%;
Local Similarity 100.0%;
ses 513; Conservative 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 MFETEHHTLLPLLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mfetehhtllpllllpsllslllfllllkrrnrktrfnlppgksgwpflgetigylkpyt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     {\tt kkftfnlmakhimsmdpgeeeteqlkkeyvtfmkgvvsaplnlpgtayhkalqsratilk}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fierkmeerkldikeedqeeeevktedeaemsksdhvrkgrtdddllgwvlkhsnlsteg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       513 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           compositions.
                                                                                                                                                                                                                                             (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11; 113pp;
                                                                                                                                                                                                                                                                                                                                                Protein;
                                                                                                                                          hydroxylase; identification; brassinosteroid;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2681; DB 21;
Pred. No. 6.6e-229;
); Mismatches 0;
                                                                                                                plant; recombinant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                production;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           48C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
```

```
Š
                                                                                                                                                                                   Q
                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                          밁
                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The present sequence is Arabidopsis thaliana cytochrome P450-type hydroxylase. The hydroxylase can be used to identify brassinosteroids or brassinosteroid inhibitors, useful to produce plants with modified physiological and/or phenotypic characteristics. The modified plants may show, e.g. stimulation of growth, increased cell elongation, increased wood production, accelerated seed germination at low temperatures, an increase in dry weight, repressed anthocyanin production during growth in light and/or inhibited de-etiolation which is induced, e.g. by cytokinin, in the dark or an increase in stress tolerance. The hydroxylase or its coding sequence can also be used for the recombinant production
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             New isolated plant cytochrome P450-type hydroxylase gene - used to identify substances acting as brassino-steroid(s) or brassinostero inhibitors for the production of modified plants
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 1; Pages 44-46; 77pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Altmann T,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (PLAC ) MAX PLANCK GES FOERDERUNG WISSENSCHAFTEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            27-MAR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO9735986-A1
                                      432
                                                                          337
                                                                                                                                                 279
                                                                                                                                                                                                                         233
                                                                                                                                                                                                                                                            252
                                                                                                                                                                                                                                                                                                182
                                                                                                                                                                                                                                                                                                                                   192
                                                                                                                                                                                                                                                                                                                                                                       124
                                                                                                                                                                                                                                                                                                                                                                                                           132
                                                                                                                                                                                                                                                                                                                                                                                                                                          64 varygsvfmthlfgeptifsadpetnrfvlqnegklfecsypasicnllgkhslllmkgs 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12 LLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFWQQH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      compounds, e.g. teasterone.
                                                                                                       NETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQ 431
                                                                                                                                                                                                                                                                                                                                                                                                       MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             llllssiaagfl---lllrrtryrrmglppgslglpllgetfqligayktenpepfider
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1997-489649/45
                                                                                                                                               gyettstimtlavkfltetplalaqlkeehekiramksd--syslewsdyksmpftqcvv
                                                                                                                                                                                     GHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVI 371
                                                                                                                                                                                                                        vvvmkrreeeeegae-----rkkdmlaallaaddgfsdeeivdflvallva
                                                                                                                                                                                                                                                          DIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFA
                                                                                                                                                                                                                                                                                                                                   IMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKL
                                      QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                      netlrvaniiggvfrramtdveikgykipkgwkvfssfravhldpnhfkdartfnpwrwg
                                                                                                                                                                                                                                                                                              lmsfdpg-ewseslrkeyllviegffslplplfsttyrkaigar-----rkvaealt 232
                                                                                                                                                                                                                                                                                                                                                                     lhkrmhsltmsfanssiikdhlmldidrlvrfnldswssrvll--meeakkitfeltvkq 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           210;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAT85306, AAT85307.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     472 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Koncz C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
97WO-EP01586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          36.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mathur J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. 3e-78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 978.5; DB 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Szekeres MA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      or brassinosteroid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
```

8

397

446

396

336

28-MAY 1999; 01-JUN 1999; 03-JUN 1999; 04-JUN 1999; 07-JUN 1999; 08-JUN 1999; 10-JUN 1999; 10-JUN 1999; 14-JUN 1999; 16-JUN 1999; 16-JUN 1999; 16-JUN 1999; 17-JUN 1999;	5-FEB-2000 5-FEB-2000 5-FEB-1999 5-MAR-1999 3-MAR-1999 9-MAR-1999 1-APR-1999 6-APR-1999 6-APR-1999 9-APR-1999 9-APR-1999 9-APR-1999 1-APR-1999 1-APR-1999 1-APR-1999 1-APR-1999 1-APR-1999 1-APR-1999 1-APR-1999 1-APR-1999 1-APR-1999 1-MAY-1999 1-MAY-1999 1-MAY-1999 1-MAY-1999 1-MAY-1999	Oy 491 DDFFAFFYDEPNGLPIRVSR 511
04 05 05 06 06 09 09 11 11 13	PR R R R R R R R R R R R R R R R R R R	118 118 118 118 118 118 118 118 118 118
AUG-199	AUG-1999  AUG-1999	JUL-196 JUL-19
- SD6 - SD6	990S-0142803 990S-0142803 990S-0142920 990S-0143542, 990S-0144085 990S-0144085 990S-0144325 990S-0144333 990S-0144335 990S-0144335 990S-0144335 990S-0144814 990S-0145088 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087 990S-0145087	- SD66

```
Query Match
Best Local Similarity
Matches 210; Conserv
                                                                                                                                                                                                           16-AUG-1999
18-AUG-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
23-AUG-1999
23-AUG-1999
25-AUG-1999
27-AUG-1999
28-EP-1999
28-EP-1999
28-EP-1999
29-EEP-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
22-CCT-1999
23-CCT-1999
24-CCT-1999
25-CCT-1999
26-CCT-1999
27-CCT-1999
28-CCT-1999
28-CCT-1999
29-CCT-1999
21-CCT-1999
22-CCT-1999
23-CCT-1999
24-CCT-1999
25-CCT-1999
26-CCT-1999
26-CCT-1999
27-CCT-1999
28-CCT-1999
28-CCT-1999
28-CCT-1999
28-CCT-1999
29-CCT-1999
   64
                                    72
                                                                                                       12
                                                                        7
                                                                 varygsvfmthlfgeptifsadpetnrfvlqnegklfecsypasicnllgkhslllmkgs 123
                         VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD 131
                                                                                                                                  36.5%;
nilarity 41.9%;
Conservative 79
                                                                                                                                                                                                           9908-0149368.
9908-0149476.
9908-0149476.
9908-0149722.
9908-0149902.
9908-0150884.
9908-0151066.
9908-0151066.
9908-0151066.
9908-0151066.
9908-0151066.
9908-0151066.
9908-0151066.
9908-0151066.
9908-0151066.
9908-0155659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-0156659.
9908-016669.
9908-0166741.
9908-0166981.
9908-0166981.
9908-0161369.
9908-0161369.
9908-0161369.
9908-0161369.
9908-0161369.
9908-0161369.
9908-0161361.
                                                                                                                                      ; Score 978.5; DB 21;
; Pred. No. 3e-78;
79; Mismatches 171;
                                                                                                                                          Indels
                                                                                                                                                                       Length
                                                                                                                                                                          472;
                                                                                                                                        41;
                                                                                                                                        Gaps
                                                                      63
                                                                                                                                        8
RRESULT

RRESULT

RAG45022

ID AAG4

AC AAG4

AC AAG4

AC AAG4

AC ATAB

AC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
25-FEB-1999

05-MAR-1999

09-MAR-1999

23-MAR-1999

25-MAR-1999

01-APR-1999

01-APR-1999

01-APR-1999

16-APR-1999

16-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

24-APR-1999

25-APR-1999

27-APR-1999

28-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999

30-APR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                                                                                                                                                                                                                                                                        06-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          hybridisation assay; termination sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAG45022;
                                                                                                                                                                                                                                                                                                                                                                                      25-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           EP1033405-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Arabidopsis thaliana protein fragment SEQ ID NO: 56469.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAG45022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gyettstimtlavkfltetplalaqlkeehekiramksd--syslewsdyksmpftqcvv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 vvvmkrreeeeegae----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMDFTQCVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    dklvffpttrtqkrypifvkr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOPFAFPFVDFPNGLPIRVSR 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                      2000EP-0301439
99US-0121825

99US-0125788

99US-0125788

99US-0126785

99US-0126785

99US-0127462

99US-0128234

99US-0128234

99US-012875

99US-0130077

99US-0130410

99US-0130410

99US-0131449

99US-0132485

99US-0132485

99US-0132485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      snsvttgpsnvftpfgggprlcpgyelarvalsvflhrlvtgfswvpaeg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----rkkdmlaallaaddgfsdeeivdflvallva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A
```

סיסרים כי סיסים סיסים מיסים סיסים סיסים סיסים סיסים מיסים מ

ô , 많

밁 õ

טרים הרו	PR PR
14 - MAY - 1999; 18 - MAY - 1999; 19 - MAY - 1999; 20 - MAY - 1999; 21 - MAY - 1999; 22 - MAY - 1999; 24 - MAY - 1999; 26 - MAY - 1999; 27 - MAY - 1999; 28 - MAY - 1999; 27 - MAY - 1999; 28 - MAY - 1999; 29 - JUN - 1999; 21 - JUN - 1999; 21 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 26 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 21 - JUN - 1999; 21 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 26 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 21 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 26 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 20 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 20 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 20 - JUN - 1999; 20 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 20 - JUN - 1999; 20 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 20 - JUN - 1999; 20 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 26 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 20 - JUN - 1999; 20 - JUN - 1999; 20 - JUN - 1999; 21 - JUN - 1999; 22 - JUN - 1999; 23 - JUN - 1999; 24 - JUN - 1999; 25 - JUN - 1999; 26 - JUN - 1999; 27 - JUN - 1999; 28 - JUN - 1999; 29 - JUN - 1999; 20 - J	MAY
990S-0134221 990S-0134370 990S-0134941 990S-0135323 990S-0135323 990S-0135323 990S-0136392 990S-0137522 990S-0137522 990S-0137522 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-0139453 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-014923 990S-0144338 990S-0144308 990S-0145088 990S-0145088 990S-0145089	99US-0132863. 99US-0134256. 99US-0134218.
ייט ק קר שר	ס פ פ פ פ פ פ
77-JUL- RR 27-JUL- RR 27-JUL- RR 27-JUL- RR 28-JUL- RR 02-AUG- RR 02-AUG- RR 04-AUG- RR 04-AUG- RR 113-AUG- RR 113-AUG- RR 120-AUG- RR 120-AUG- RR 113-AUG- RR 120-AUG- RR 213-AUG- RR 221-AUG- RR 113-OCT- RR 114-OCT- RR 114-OCT- RR 114-OCT- RR 211-OCT-	23-JUL-199 23-JUL-199 23-JUL-199
R 27-JUL-1999 R 28-JUL-1999 R 29-JUG-1999 R 29-JUG-1999 R 11-JUG-1999 R 21-JUG-1999 R 21-JUG-1999 R 21-JUG-1999 R 21-JUG-1999 R 21-JUG-1999 R 21-JUG-1999	23-JUL-1999; 99US-014514 23-JUL-1999; 99US-014521 23-JUL-1999; 99US-014521

```
RESULT
AAG45021
                                                                                                                                                                                                                                                                                                     ₽.
                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₽
Ş
                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                       ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ő
                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22-OCT-1999
22-OCT-1999
22-OCT-1999
25-OCT-1999
25-OCT-1999
25-OCT-1999
26-OCT-1999
26-OCT-1999
26-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
29-OCT-1999
                   EP1033405-A2
                                          Arabidopsis thaliana
                                                                          Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter
                                                                                                                                                                                          AAG45021 standard;
                                                                                                                Arabidopsis
                                                                   termination
                                                                                                                                           18-OCT-2000
                                                                                                                                                                                                                                                         447
                                                                                                                                                                                                                                                                                491
                                                                                                                                                                                                                                                                                                                              432
                                                                                                                                                                                                                                                                                                                                                      337
                                                                                                                                                                                                                                                                                                                                                                             372
                                                                                                                                                                                                                                                                                                                                                                                                    279
                                                                                                                                                                                                                                                                                                                                                                                                                           312
                                                                                                                                                                                                                                                                                                                                                                                                                                                   233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match 36.5%; St. Local Similarity 41.9%; Press 210; Conservative 79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12 LLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7
                                                                                                                                                                                                                  σ
                                                                                                                                                                                                                                                                                                                                                                                                 VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD 131
|::|| :: ::|||||| || |||:||||||||| || :||: |
| varygsvfmthlfgeptifsadpetnrfvlqnegklfecsypasicnllgkhslllmkgs 123
                                                                                                                                                                                                                                                   dklvffpttrtqkrypifvkr 467
                                                                                                                                                                                                                                                                                                                                                 vvvmkrreeeeegae-----rkkdmlaallaaddgfsdeeivdflvallva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEERKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DOPFAFPFVDFPNGLPIRVSR 511
                                                                                                                                                                                                                                                                                                                  QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSNLSTEQILDLILSLLFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                lmsfdpg-ewses1rkey11v1egffs1p1p1fsttyrkaiqar----rkvaealt
                                                                                                                                                                                                                                                                                                    -----snsvttgpsnvftpfgggprlcpgyelarvalsvflhrlvtgfswvpaeq
                                                                                                                thaliana protein fragment SEQ ID NO:
                                                                 sequence
                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           99US-0160980
99US-0160981
99US-0161404
99US-0161404
99US-0161405
99US-0161359
99US-0161350
99US-0161360
99US-0161361
99US-0161920
99US-0161920
99US-0161993
99US-0161993
                                                                                                                                                                                          Protein; 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 978.5; DB 21; Length 472; Pred. No. 3e-78;
                                                                                                                                                                                           Ā
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              171;
                                                                                                                  56468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                             promoter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                     446
                                                                                                                                                                                                                                                                                                                              490
                                                                                                                                                                                                                                                                                                                                                                           431
                                                                                                                                                                                                                                                                                                                                                                                                                         371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63
                                                                                                                                                                                                                                                                                                                                                    396
                                                                                                                                                                                                                                                                                                                                                                                                    336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                   278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8;
      25-FEB-1999
09-MAR 1999
09-MAR 1999
09-MAR 1999
23-MAR 1999
06-APR 1999
06-APR 1999
08-APR 1999
08-APR 1999
08-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
24-MAY 1999
06-MAY 1999
06-MAY 1999
11-MAY 1999
11-MAY 1999
11-MAY 1999
11-MAY 1999
11-MAY 1999
11-MAY 1999
11-JUN 1999
11-JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            06-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000EP-0301439
  990S-0125788.
990S-0125788.
990S-0126785.
990S-0126785.
990S-0126785.
990S-0126814.
990S-013044.
990S-013044.
990S-0131449.
990S-013246.
990S-013246.
990S-0134718.
990S-0134718.
990S-0134718.
990S-0134718.
990S-0134718.
990S-0134718.
990S-0134719.
990S-0139451.
990S-0139452.
990S-0139452.
990S-0139453.
990S-0140833.
990S-0140833.
990S-0140833.
990S-0140833.
990S-0140893.
990S-0141847.
990S-0141847.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99US-0121825
99US-0123180
```

```
Ω
                                                                                                                                                     Qy
                                       g
VQ
                                                               В
                                                                            Qy
                                                                                          В
                                                                                                   δĀ
                                                                                                                  밁
                                                                                                                                          망
                                                                                                                                                                           Qy
                                                                                                                                                                                                                  Ъ
                          δÃ
                                                                                                                                                                  멍
                                                                                                                                                                                         Query Ma
Best Loc
Matches
                                                                                                                                                                                                                23-SEP 1999
28-SEP 1999
28-SEP 1999
29-SEP 1999
04-OCT 1999
05-OCT 1999
06-OCT 1999
13-OCT 1999
13-OCT 1999
13-OCT 1999
14-OCT 1999
14-OCT 1999
14-OCT 1999
14-OCT 1999
12-OCT 1999
14-OCT 1999
14-OCT 1999
14-OCT 1999
12-OCT 1999
21-OCT 1999
22-OCT 1999
22-OCT 1999
23-OCT 1999
25-OCT 1999
26-OCT 1999
26-OCT 1999
27-OCT 1999
28-OCT 1999
       432
                   356
                                          298
                                                      312
                                                                  252
                                                                              252
                                                                                          201
                                                                                                      192
                                                                                                                  143
                                                                                                                             132
                                                                                                                                          83
                                                                                                                                                                             12
                                                                                                                                                     72
                                                                                                                                                                 26
                                                                                                                                                                                                Local
                                                                                                                                                                                                     Match
                                                                                                                                                                LLLLPSLLSLLLFLILLKRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQQH
                                                                                                                QQNNGASSSGSGSFSTWGNN-YMPFGGGPRLCAGSELAKLEMAVFIHHLVLKFNWELAED
                                                                                                                                                                                         of Similarity 41.9
210; Conservative
                                                                                                                                                                                                                990S-0155486
990S-0156596
990S-0157187
990S-0157853
990S-0158232
990S-0159294
990S-0159294
990S-0159330
990S-01595330
990S-01595330
990S-01595330
990S-0160767
990S-0160767
990S-0160767
990S-0160767
990S-0160814
990S-0161404
990S-0161350
990S-0161350
990S-0161350
990S-0161350
990S-0161350
990S-0161350
990S-0161350
                                                                                                                                                                                               36.5%;
79;
                                                                                                                                                                                         Score 978.5; Di
Pred. No. 3.2e-
79; Mismatches
                                                                                                                                                                                         .2e-78;
.es 171;
                                                                                                                                                                                                     DB
                                                                                                                                                                                                     21;
                                                                                                                                                                                         Indels
                                                                                                                                                                                                     Length
 =
                                                                                                                                                                                         41;
                                                                                                                                                                                         Gaps
                              431
                                                                             311
                                                                                                                              191
                                                                                                                                          142
                                                                                                                                                      131
                                                                                                                                                                              71
                   415
                                          355
                                                                                          251
                                                                                                      251
                                                                                                                  200
                                                                                                                                                                  82
                                                      371
                                                                  297
                                                                                                                                                                                         8
```

06-JUL-1999
09-JUL-1999
09-JUL-1999
11-JUL-1999
12-JUL-1999
13-JUL-1999
13-JUL

99US-0142390.
99US-0142920.
99US-0142920.
99US-014364.
99US-0144085.
99US-0144086.
99US-0144331.
99US-0144331.
99US-0144332.
99US-0144332.
99US-0144332.
99US-0144332.
99US-0144332.
99US-0144332.
99US-0144333.
99US-0145086.
99US-0145086.
99US-0145192.
99US-0145192.
99US-0145193.
99US-0145918.
99US-0145918.
99US-0145918.
99US-0147192.
99US-0147192.
99US-0147192.
99US-0147193.
99US-0147193.
99US-0147193.
99US-0149368.
99US-0149368.
99US-0149368.
99US-0149368.
99US-0149368.
99US-0149368.
99US-014936.
99US-01493

RESULT AAAG4 4570 AAAG4 4570 AAC AAAG XXX AC AAAG AAAG AAAG AAAG AAAG AAAG AAAG A	Oy Oy
6 44570 stand 44570;  44570;  44570;  CCT-2000 ( bidopsis the tein identification see bidopsis the bidopsis t	4164 491 DQPFAFPFV  :    466 dklvffptt
Standard; Protein; 492 AA.	snsvttgpsnvftpfgggprlcpgyelarvalsvflhrlvtgfswvpaeq 465 DQPFAFPFVDFPNGLPTRVSR 511  :
מה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה	PR P
	1-199
990S-0139460 990S-0139461 990S-0139463 990S-0139763 990S-0139817 990S-014093 990S-014093 990S-0140823 990S-0141842 990S-0141842 990S-014290 990S-014290 990S-014290 990S-014290 990S-014290 990S-014290 990S-0143542 990S-0144085 990S-0145085 990S-0145085 990S-0145085 990S-0145085 990S-0145085 990S-0145085 990S-0145085 990S-0145085 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038 990S-0147038	90S-013945 90S-013945 90S-013945 90S-013945 90S-013945 90S-013945

298

490 416 431 356

466

311

252

191

201

251

```
Š
                       밁
                                          ρy
                                                                   Query Match
Best Local S
Matches 210
                                                                                                               18-AUG-1999
20-AUG-1999
20-AUG-1999
21-AUG-1999
22-AUG-1999
23-AUG-1999
25-AUG-1999
27-AUG-1999
27-AUG-1999
31-AUG-1999
31-AUG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13-AUG-1999;
13-AUG-1999;
16-AUG-1999;
17-AUG-1999;
18-AUG-1999;
20-AUG-1999;
                                                                   hes 210;
  72
                       27
                                              12
                    VSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLVGD 131
                                                                              Similarity
                                                                    Conservative
                                                                                                              9905-0149902

9905-015066

9905-015066

9905-0151080

9905-0151066

9905-0151080

9905-0151080

9905-015303

9905-015303

9905-0154018

9905-015403

9905-0154479

9905-0154486

9905-0154486

9905-0154785

9905-0154786

9905-0154786

9905-0154786

9905-0154786

9905-0154786

9905-0154786

9905-0154786

9905-0154786

9905-0158029

9905-0158029

9905-0158029

9905-0159329

9905-0159331

9905-0159331

9905-0159331

9905-0160741

9905-0160815

9905-0160815

9905-0160815

9905-0160815

9905-0161404

9905-0161404

9905-0161404

9905-0161404

9905-0161404

9905-0161404

9905-0161404

9905-0161404

9905-0161359

9905-0161404

9905-0161359

9905-0161404

9905-0161361

9905-0161359

9905-0161404

9905-0161361

9905-0161361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99US-0148684
99US-0149368
99US-0149175
99US-0149426
99US-0149722
99US-0149723
99US-0149929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99US-0148565
99US-0148684
                                                                              36.5%;
                                                                 79;
                                                                 Score 978.5; DB 21;
Pred. No. 3.2e-78;
9; Mismatches 171;
                                                                                        21;
                                                                    Indels
                                                                                       Length
                                                                   41;
                                                                  Gaps
                        83
                                             71
                                                                   8;
 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
05-MAR 1999
05-MAR 1999
09-MAR 1999
23-MAR 1999
25-MAR 1999
29-MAR 1999
01-APR 1999
01-APR 1999
01-APR 1999
116-APR 1999
21-APR 1999
21-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
30-APR 1999
30-APR 1999
30-APR 1999
30-APR 1999
                                                                                                                                                                                                                                                                                                                             Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                                                                                                                                                                                                                 Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                       18-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                              AAG44572;
                                                                                                                                                                                                                                                                                                                                                                                                                                    AAG44572
                                                                                                                                                                                                                                                    06-SEP-2000
                                                                                                                                                                                                                                                                                             Arabidopsis
                                                                                                                                                                                                                             25-FEB-2000;
                                                                                                                                                                                                                                                                         EP1033405-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                84
                                                                                                                                                                                                                                                                                                                                                                                                                                                        7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DQPFAFPFVDFPNGLPIRVSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLFNPWRWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dklvffpttrtqkrypifvkr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 netlrvaniiggvfrramtdveikgykipkgwkvfssfravhldpnhfkdartfnpwrwq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             standard;
                                                                                                                                                                                                                                                                                                                    sequence
                                                                                                                                                                                                                                                                                                                                                                 thaliana protein fragment SEQ
                                                                                                                                                                                                                                                                                                                                                                                       (first
                                                                                                                                                                                                                             2000EP-0301439
990S-0121825

990S-012548

990S-0125788

990S-0125788

990S-0127452

990S-0127452

990S-0127452

990S-0128714

990S-013945

990S-0130449

990S-0130449

990S-0131449

990S-01324485

990S-0132485
                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein;
                                                                                                                                                                                                                                                                                                                                                                                       entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                511
                                                                                                                                                                                                                                                                                                                                                                                                                                    444
                                                                                                                                                                                                                                                                                                                                                                                                                                    A
```

ID NO: 55848

	ស់ ស់ ស់ ស់ ស់ ស់ សំ សំ សំ សំ សំ ស់ ស់ ស់ សំ ស់ ស់ ស
007 1108 1108 1108 1108 1108 1108 1108 1	06 06 07 07 11 11 11 11 11 11 11 11 11 11 11 11 11
07 JUN 100 NO	06-MAY- 06-MAY- 11-MAY- 11-MAY
	ZZZKKKKKKKKKKKKKKK
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9905-0137724 9905-013847 9905-013847 9905-0139452 9905-0139453 9905-0139455 9905-0139457 9905-0139458 9905-0139458 9905-0139461 9905-0139461 9905-0139461 9905-0139463 9905-014055 9905-014055 9905-014055 9905-014055 9905-0140695 9905-014065 9905-014065 9905-014065 9905-014065 9905-014065 9905-014465 9905-0144632 9905-0144684 9905-0144684 9905-0144684 9905-0144684	90000000000000000000000000000000000000
	) ) ) ) ) ) ) ) ) ) ) ) ) )
7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2218487 2218687 2218687 221968 221968 221992
	•
ט א ג ג ג ג ג ג ג ג ג ג ג ג ג ג ג ג ג ג	ק קקק קקקקקקקקקקקקקקקקקקקקקקקקקקקקקקק
. א ה א א א א א א א א א א א א א א א א א	**************************************
. א ה א א א א א א א א א א א א א א א א א	**************************************
96-AUG-1 RR 10-AUG-1 RR 11-AUG-1 RR 11-AUG-1 RR 11-AUG-1 RR 11-AUG-1 RR 120-AUG-1 RR 20-AUG-1 RR 20-AUG-1 RR 21-AUG-1 RR 21-AU	R 22-JUL-1 R 23-JUL-1 R 23-JUL-1 R 23-JUL-1 R 23-JUL-1 R 26-JUL-1 R 26-JUL-1 R 27-JUL-1 R 28-JUL-1
06-AUG-199 R 09-AUG-199 R 11-AUG-199 R 11-AUG-199 R 11-AUG-199 R 11-AUG-199 R 11-AUG-199 R 11-AUG-199 R 12-AUG-199 R 12-AUG-199 R 12-AUG-199 R 23-AUG-199 R 23-AUG-199 R 27-AUG-199 R 27-AUG-199 R 27-AUG-199 R 27-AUG-199 R 27-AUG-199 R 11-SEP-199 R 11-SE	R 22-JUL-199 R 23-JUL-199 R 23-JUL-199 R 23-JUL-199 R 23-JUL-199 R 26-JUL-199 R 27-JUL-199 R 28-JUL-199 R 28-JUL-199 R 29-AUG-199 R 07-AUG-199
R 06-AUG-19 R 09-AUG-19 R 110-AUG-19 R 113-AUG-19 R 113-AUG-19 R 117-AUG-19 R 118-AUG-19 R 118-A	R 22-JUL-1999 R 23-JUL-1999 R 23-JUL-1999 R 23-JUL-1999 R 26-JUL-1999 R 26-JUL-1999 R 27-JUL-1999 R 27-JUL-1999 R 27-JUL-1999 R 27-JUL-1999 R 27-JUL-1999 R 27-JUL-1999 R 28-JUL-1999 R 28-JUL-1999 R 29-JUG-1999 R 28-JUG-1999 R 02-JUG-1999 R 02-JUG-1999 R 04-JUG-1999 R 05-JUG-1999 R 05-JUG-1999 R 05-JUG-1999 R 05-JUG-1999 R 05-JUG-1999 R 05-JUG-1999
06-AUG-1999; R 09-AUG-1999; R 110-AUG-1999; R 111-AUG-1999; R 113-AUG-1999; R 113-AUG-1999; R 114-AUG-1999; R 115-AUG-1999; R 117-AUG-1999; R	R 22-JUL-1999; 22-JUL-1999; 23-JUL-1999; 23-
06-AUG 1999 R 06-AUG 1999 R 09-AUG 1999 R 09-AUG 1999 R 09-AUG 1999 R 10-AUG 1999 P9US R 11-AUG 1999 P9US R 12-AUG 1999 P9US R 20-AUG 1999 P9US R 21-AUG 1999 PPUS R	R 22-JUL-1999; 99US- R 22-JUL-1999; 99US- R 23-JUL-1999; 99US- R 23-JUL-1999; 99US- R 23-JUL-1999; 99US- R 26-JUL-1999; 99US- R 27-JUL-1999; 99US- R 27-JUL-
06-AUG-1999 R 09-AUG-1999 R 10-AUG-1999 R 10-AUG-1999 R 11-AUG-1999 R 11-AUG-1999 R 11-AUG-1999 R 11-AUG-1999 R 11-AUG-1999 R 12-AUG-1999 R 11-AUG-1999 R 11-AUG-1999 R 12-AUG-1999 R 13-SEP-1999 R 13-SEP-1999 R 11-SEP-1999 R 11	R 22-JUL-1999 99US-014 R 23-JUL-1999 99US-014 R 26-JUL-1999 99US-014 R 27-JUL-1999 99US-014 R 28-JUL-1999 99US-014 R 28-JUL-1999 99US-014 R 02-AUG-1999 99US-014 R 04-AUG-1999 99US-014 R 04-AUG-1999 99US-014 R 05-AUG-1999 99US-014
06-Aug-1999; 99US-014741 R 09-Aug-1999; 99US-014743 R 10-Aug-1999; 99US-014793 R 11-Aug-1999; 99US-014884 R 11-Aug-1999; 99US-014886 R 16-Aug-1999; 99US-014886 R 16-Aug-1999; 99US-014936 R 17-Aug-1999; 99US-014936 R 17-Aug-1999; 99US-014936 R 20-Aug-1999; 99US-014972 R 20-Aug-1999; 99US-014972 R 20-Aug-1999; 99US-014990 R 23-Aug-1999; 99US-014990 R 23-Aug-1999; 99US-015106 R 27-Aug-1999; 99US-015106 R 27-Aug-1999; 99US-015108 R 28-Ep-1999; 99US-015108 R 29-Ep-1999; 99US-015505 R 28-Ep-1999; 99US-015505 R 29-Ep-1999; 99US-015606 R 29-Ep-1999	R 22-JUL-1999; 99US-014508 R 22-JUL-1999; 99US-014514 R 23-JUL-1999; 99US-014521 R 23-JUL-1999; 99US-014521 R 23-JUL-1999; 99US-014527 R 26-JUL-1999; 99US-014527 R 27-JUL-1999; 99US-014531 R 27-JUL-1999; 99US-014531 R 27-JUL-1999; 99US-014638 R 27-JUL-1999; 99US-014638 R 02-AUG-1999; 99US-014638 R 02-AUG-1999; 99US-014706 R 04-AUG-1999; 99US-014706 R 04-AUG-1999; 99US-014706 R 05-AUG-1999; 99US-014706
06-AUG-1999 99US-0114 R 09-AUG-1999 99US-0144 R 110-AUG-1999 99US-0144 R 11-AUG-1999 99US-0144 R 12-AUG-1999 99US-0144 R 20-AUG-1999 99US-0144 R 21-AUG-1999 99US-0154 R 21-AUG-1999 99US-0155 R 27-AUG-1999 99US-0155 R 21-SEP-1999 99US-0155 R 21-SEP-1999 99US-0155 R 11-SEP-1999 99US-0155 R 11-SE	R 22-JUL-1999; 99US-014508 R 22-JUL-1999; 99US-014514 R 23-JUL-1999; 99US-014521 R 23-JUL-1999; 99US-014521 R 23-JUL-1999; 99US-014527 R 26-JUL-1999; 99US-014527 R 27-JUL-1999; 99US-014531 R 27-JUL-1999; 99US-014531 R 27-JUL-1999; 99US-014638 R 27-JUL-1999; 99US-014638 R 02-AUG-1999; 99US-014638 R 02-AUG-1999; 99US-014706 R 04-AUG-1999; 99US-014706 R 04-AUG-1999; 99US-014706 R 05-AUG-1999; 99US-014706
06-Aug-1999 R 09-Aug-1999 R 09-Aug-1999 R 09-Aug-1999 R 10-Aug-1999 R 11-Aug-1999 R 11-Aug-1999 R 12-Aug-1999 R 12-Aug-1999 R 13-Aug-1999 R 14-Aug-1999 R 15-Aug-1999 R 16-Aug-1999 R 17-Aug-1999 R 17-Aug-1999 R 17-Aug-1999 R 18-Aug-1999 R 20-Aug-1999 R 20-Aug-1999 R 23-Aug-1999 R 23-Aug-1999 R 23-Aug-1999 R 23-Aug-1999 R 23-Aug-1999 R 23-Aug-1999 R 27-Aug-1999 R 28-Ep-1999 R 29-Ep-1999 R 2	R 22-JUL-1999; 99US-014508 R 22-JUL-1999; 99US-014514 R 23-JUL-1999; 99US-014521 R 23-JUL-1999; 99US-014521 R 23-JUL-1999; 99US-014527 R 26-JUL-1999; 99US-014527 R 27-JUL-1999; 99US-014531 R 27-JUL-1999; 99US-014531 R 27-JUL-1999; 99US-014638 R 27-JUL-1999; 99US-014638 R 02-AUG-1999; 99US-014638 R 02-AUG-1999; 99US-014706 R 04-AUG-1999; 99US-014706 R 04-AUG-1999; 99US-014706 R 05-AUG-1999; 99US-014706

```
RESULT
AAG45023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 35.3%;
Best Local Similarity 41.8%;
Matches 198; Conservative 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21-OCT-1999
21-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
25-OCT-1999
25-OCT-1999
26-OCT-1999
26-OCT-1999
26-OCT-1999
26-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
29-OCT-1999
                                                                                                                                                                              18-OCT-2000
                                                                                                                                                                                                        AAG45023;
                                           EP1033405-A2
                                                                   Arabidopsis thaliana
                                                                                                        Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                 Arabidopsis thaliana protein fragment SEQ ID NO: 56470.
                                                                                                                                                                                                                                  AAG45023
                                                                                              termination sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               219
                                                                                                                                                                                                                                                                                                     386
                                                                                                                                                                                                                                                                                                                              458
                                                                                                                                                                                                                                                                                                                                                         336
                                                                                                                                                                                                                                                                                                                                                                                    399
                                                                                                                                                                                                                                                                                                                                                                                                              278
                                                                                                                                                                                                                                                                                                                                                                                                                                        339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω
                                                                                                                                                                                                                                                            æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fvlqnegklfecsypasicnllgkhslllmkgslhkrmhsltmsfanssiikdhlmldid
                                                                                                                                                                                                                                                                                                GPRLCAGSELAKLEMAVFIHHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRVSR 511
                                                                                                                                                                                                                                                                                                                                                      APLNLPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rlvrfnldswssrvll--meeakkitfeltvkqlmsfdpg-ewseslrkeyllviegffs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RHTLFVLDSWQQNSIFSAQDEAKKFTFNLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILQNEGRLFECSYPRSIGGILGKWSMLVLVGDMHRDMRSISLNFLSHARLRTILLKDVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    lplplfsttyrkaigar-----rkvaealtvvvmkrreeeeegae------
                                                                                                                                                                                                                                  standard;
                                                                                                                                                                             (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          99US-0160814
99US-01609815
99US-0160981
99US-0160981
99US-0161404
99US-0161406
99US-0161406
99US-0161361
99US-0161361
99US-0161361
99US-0161920
99US-0161920
99US-0161993
99US-0161993
                                                                                                                                                                                                                                  Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Score 946; DB 21;
; Pred. No. 2.1e-75;
77; Mismatches 161;
                                                                                                                                                                                                                                 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 444;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                    457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                                                                                                                                      398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    219
                                                                                                                                                                                                                                                                                                                                                         385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7;
  18 MAY - 1999
19 - MAY - 1999
20 - MAY - 1999
21 - MAY - 1999
21 - MAY - 1999
22 - MAY - 1999
23 - MAY - 1999
25 - MAY - 1999
26 - MAY - 1999
27 - MAY - 1999
28 - MAY - 1999
29 - JUN - 1999
20 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
25 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - 1999
21 - JUN - 1999
21 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
25 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - 1999
20 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - 1999
20 - JUN - 1999
20 - JUN - 1999
21 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
25 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - 1999
20 - JUN - 1999
20 - JUN - 1999
21 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
25 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - 1999
20 - JUN - 1999
21 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
25 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - 1999
20 - JUN - 1999
21 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
25 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - 1999
20 - JUN - 1999
21 - JUN - 1999
21 - JUN - 1999
22 - JUN - 1999
23 - JUN - 1999
24 - JUN - 1999
25 - JUN - 1999
26 - JUN - 1999
27 - JUN - 1999
28 - JUN - 1999
29 - JUN - JUN - 1999
20 - JUN - JUN - 1999
20 - JUN - JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-FEB-1999
05-MAR 1999
09-MAR 1999
23-MAR 1999
25-MAR 1999
25-MAR 1999
01-APR 1999
01-APR 1999
16-APR 1999
16-APR 1999
23-APR 1999
24-APR 1999
30-APR 1999
30-APR 1999
30-APR 1999
30-APR 1999
31-APR 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000EP-0301439
9908 012624

9908 012834

9908 012834

9908 012834

9908 013041

9908 013048

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013248

9908 013422

9908 013422

9908 01362

9908 01362

9908 01362

9908 01362

9908 01362

9908 01362

9908 01362

9908 01362

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 013945

9908 014083

9908 014284
```

```
Qy
                                                                δÃ
                                                                                        Qγ
                                                                                                                  γQ
                                                                                                                                             Q
                                                                                                                                                                      Ş
                           В
                                                     Ъ
                                                                               В
                                                                                                        B
                                                                                                                                  Ъ
                                                                                                                                                           Ъ
                                                                                                                                                                                      В
                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                          Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                         28-SEP-1999
28-SEP-1999
04-OCT-1999
05-OCT-1999
06-OCT-1999
07-OCT-1999
11-OCT-1999
13-OCT-1999
13-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
12-OCT-1999
21-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
23-OCT-1999
25-OCT-1999
25-OCT-1999
26-OCT-1999
26-OCT-1999
27-OCT-1999
28-OCT-1999
28-OCT-1999
  386
              458
                           336
                                                      278
                                                                  339
                                                                                220
                                                                                            279
                                                                                                         180
                                                                                                                      219
                                                                                                                                  123
                                        399
                                                                                                                                                159
                                                                                                                                                                                                               y Match 35.3%;
Local Similarity 41.8%;
hes 198; Conservative '
                                                                                                                                                           63
                                                                                                                                                                         99
                                                                                                                                                                                                   39
                                                                                                                                                                                      ω
990S-0156458
990S-0156256
990S-0157753
990S-0158229
990S-0158229
990S-0158229
990S-0159294
990S-0159295
990S-0159295
990S-0159295
990S-0159230
990S-0159330
990S-0159331
990S-0160767
990S-0160767
990S-0160767
990S-0160768
990S-0160769
990S-0161404
                                                                                                                                                                                                              ; Score 946; DB 21;
; Pred. No. 2.1e-75;
77; Mismatches 161;
                                                                                                                                                                                                                           Length
                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                             444;
                                                                                                                                                                                                                38;
             511
                                                                                                                                                                                                               Gaps
                                        457
                                                                                                                                 179
                                                                                                                                                           122
                                                                                                                                                                         158
                                                                                                                                                                                      62
                                                                                                                                                                                                  98
                           385
                                                     335
                                                                               277
                                                                                           338
                                                                                                        219
                                                                                                                     278
                                                                                                                                              218
                                                                                                                                                                                                               7
```

09-JUL-1999
13-JUL-1999
14-JUL-1999
15-JUL-1999
16-JUL-1999
16-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
20-JUL-1999
20-JUL-1999
21-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
23-JUL-1999
23-JUL-1999
23-JUL-1999
24-JUL-1999
25-JUL-1999
26-JUL-1999
27-JUL-1999
28-JUL-1999
28-JUL-1999
29-JUL-1999
20-AUG-1999
21-AUG-1999
21-AUG-1999
21-AUG-1999
21-AUG-1999
22-AUG-1999
23-JUL-1999
23-AUG-1999
24-AUG-1999
25-AUG-1999
26-AUG-1999
27-AUG-1999
28-JUL-1999
29-AUG-1999
29-AUG-1999
20-AUG-1999
21-AUG-1999
22-AUG-1999
23-AUG-1999
23-AUG-1999
24-SEP-1999
25-SEP-1999
25-SEP-1999
25-SEP-1999
25-SEP-1999
26-SEP-1999
27-AUG-1999
27-AUG-1999
28-SEP-1999
28-SEP-1999
28-SEP-1999
29-SEP-1999

99US-0142920
99US-01429720
99US-0143624
99US-0144085
99US-0144085
99US-0144085
99US-0144085
99US-0144332
99US-0144333
99US-0144333
99US-0144333
99US-0144333
99US-0144333
99US-0144884
99US-014598
99US-014598
99US-014598
99US-0145913
99US-0145913
99US-0145913
99US-0146388
99US-0146388
99US-0146388
99US-0147302
99US-0146388
99US-0147303
99US-0147303
99US-0148341
99US-0147303
99US-0147303
99US-0148341
99US-0147303
99US-0147303
99US-0147303
99US-0148341
99US-0147303
99US-01477303

PR 0.5-FEB-1999 9995-012318.5  PR 0.5-MAR 1999 9995-012318.6  PR 0.5-MAR 1999 9995-012578.8  PR 0.5-MAR 1999 9995-012678.6  PR 1.5-MAR 1999 9995-013679.6  PR 2.5-MAR 1995-013679.6  PR 2.5-MAR 1995-013679.6  PR 2.5-MAR 1995-013679.6  PR 2.5-MAR 1995	RESULT 9 AAG46490 ID AAG46490 standard; Protein; 461 AA.  XX AC AAG46490; XX AC AAG46490; XX DE Arabidopsis thaliana protein fragment SEQ ID NO: 58494.  XX DE Arabidopsis thaliana protein fragment SEQ id No: 58494.  XX DE Arabidopsis thaliana protein mapping; gene expression control; promoter;  XX OS Arabidopsis thaliana.  XX PN EP1033405-A2.  XX PD 06-SEP-2000.  XX 25-FEB-2000; 2000EP-0301439.
אקים אקים אקים אקים אקים אקים אקים אקים	מק אק מק
211 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1000000322222221111111
JUL-1999 JUL	
11443624 144444444444444444444444444444444444	908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011 908-011

20-AUG-1999; 20-AUG-1999; 23-AUG-1999;

425 476 376 416 316 356 258 296

```
16-SEP-1999
20-SEP-1999
22-SEP-1999
23-SEP-1999
24-SEP-1999
29-SEP-1999
29-SEP-1999
20-CCT-1999
20-CCT-1999
20-CCT-1999
21-CCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23-AUG-1999
25-AUG-1999
26-AUG-1999
27-AUG-1999
27-AUG-1999
27-AUG-1999
30-AUG-1999
31-AUG-1999
31-AUG-1999
31-AUG-1999
31-AUG-1999
                                                                                                 LLLLPSLLSLLLFLILLKRRN--RKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQ
                                         gsshrlmrgsllslisstmmrdhilpkvdhfmrsyldqwnelevidiqdktkhmaflssl
                      GDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTF----
                                                                                                                               h 27.1%;
Similarity 32.3%;
66; Conservative 9
                                                                                                                                                                         99US-0149930
99US-0150565
99US-0151065
99US-0151065
99US-0151080
99US-01511930
99US-0151263
99US-0151263
99US-0154018
99US-0154018
99US-0154018
99US-0155406
99US-0155439
99US-0155439
99US-0155456
99US-0155456
99US-0155456
99US-0155456
99US-0155456
99US-0157753
99US-0156558
99US-0157753
99US-015823
99US-0157753
99US-015823
99US-0159331
99US-0159331
99US-0159331
99US-0160768
99US-0160768
99US-0160981
99US-0160981
99US-0161359
99US-0161359
99US-0161359
99US-0161359
99US-0161359
99US-0161359
99US-0161359
99US-0161359
                                                                                                                               Score 726; DB 21; Pred. No. 6.6e-56; 91; Mismatches 181;
                                                                                                                                                    Length
                                                                                                                               Indels
                                                                                                                               76;
                                                                                                                              Gaps
                                                                                                           69
                                                                                                                               10;
   RESULT 10
AAG46489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
25-FEB-1999

05-MAR-1999

09-MAR-1999

23-MAR-1999

25-MAR-1999

01-APR-1999

01-APR-1999

01-APR-1999

16-APR-1999

16-APR-1999

19-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

23-APR-1999

04-MAY-1999

06-MAY-1999

06-MAY-1999

06-MAY-1999

14-MAY-1999

14-MAY-1999

14-MAY-1999

14-MAY-1999
                                                                                                                                                                                                                                                                                                                                                                           Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAG46489
                                                                                                                                                                                                                                                                                 25-FEB-2000;
                                                                                                                                                                                                                                                                                                     06-SEP-2000.
                                                                                                                                                                                                                                                                                                                                             Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                         Arabidopsis thaliana protein fragment SEQ ID NO: 58493
                                                                                                                                                                                                                                                                                                                                                                                                                                18-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          {\tt gledvksmkftraviyetsrlativngvlrkttrdleingylipkgwriyvytreinyda}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDN : | | | | | | | | | | :: : |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tdeeirdqvvtilysgyetvsttsmmalkylhdhpkalqelraehlafrerkrg--depl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                llrelmgerr---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----NLMAKHIMSMDPGEEETEQLKKEYYTFMKGYVSAPLNLPGTAYHKALQSRATILK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                 sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                2000EP-0301439
9908-0121825
9908-0123180
9908-0125788
9908-0126264
9908-0127462
9908-0128214
9908-0128214
9908-0128214
9908-0130871
9908-0130810
9908-0130810
9908-013149
9908-013284
9908-013284
9908-013286
9908-013286
9908-013286
9908-013286
9908-013286
9908-013286
9908-013286
9908-013286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----dsge------tftdmlgylmkkegnrypl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A
```

07-SEP-1999; 10-SEP-1999; 13-SEP-1999; 15-SEP-1999;

δĀ

밁

116

Ş

밁 Qy

12

Query Match Best Local Sim Matches 166;

밁

קי מים סים סים סים סים סים סים סים סים סים ס	9 x 9 x 9 x 9 x 9 x 9 x 9 x 9 x 9 x 9 x
22222222222222222222222222222222222222	14 18 19 20 21 21 25 27
0.0 3. JUN-11 0.0 0.0 3. JUN-1	MAY - 1 MAY - 1
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	999999999999
	&
9905-0137528 9905-0137528 9905-0137528 9905-0138904 9905-0138919 9905-0138437 9905-0139455 9905-0139458 9905-0139458 9905-0139458 9905-0139458 9905-0139458 9905-0139458 9905-0139458 9905-0139458 9905-0139458 9905-0140353 9905-0140353 9905-0140353 9905-0140353 9905-0140353 9905-0140823 9905-0140823 9905-0140823 9905-01443352 9905-01443353 9905-01443353 9905-01443353 9905-01443353 9905-01443353 9905-01443353 9905-01443353 9905-0144335	0.500
13750 13750 13750 13945 13	13422 13437 13476 13494 13512 13535 13562 13562 13639 13639
######################################	22224604
$\cdot$	
ס טיט ס טיט טיט טיט טיט טיט טיט טיט טיט	מי מ
ស៊ីដីស៊ីដីស៊ីដីស៊ីដីស៊ីដីស៊ីដីស៊ីដីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ី	<b>សំស័ស៊ីស៊ីស៊ីស៊ីស៊ីស៊ីស៊ី</b> ស៊ីស៊ី
	27-JUL 27-JUL 27-JUL 28-JUL 28-JUL 02-AUG 02-AUG 02-AUG 03-AUG 04-AUG 04-AUG
\$\frac{\pi}{\pi} \frac{\pi}{\pi} \frac{\pi}{\p	
SD66 SD66 SD66 SD66 SD66 SD66 SD66 SD66	D66 D66 D66 D66 D66 D66
477360 477493 477493 48319 488319 488341 489293 499293 499293 499293 499293 499293 499293 499293 499293 499293 499293 499293 499293 59030 500665 510665	45913 45918 45919 45951 46386 16388 16388 17203 17204 17302

```
RESULT 11
AAG40491
ID AAG464
XX AAG464
XX AAG464
XY ARAbid
XX Protei
KW Protei
KW Protei
KW hybrid
XX Arabid
XX Protei
KW termin
XX Arabid
XX Termin
XX Arabid
XX Termin
XX Arabid
XX Arabid
XX FFE
XX 25-FEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 166; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25-OCT-1999;
25-OCT-1999;
26-OCT-1999;
26-OCT-1999;
26-OCT-1999;
28-OCT-1999;
28-OCT-1999;
29-OCT-1999;
                                                                                                                                                                                                hybridisation assay; termination sequence.
                                                                                                                                                                                                                 Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                                                                                                                                                                                                                                                            AAG46491 standard;
                                      25-FEB-2000; 2000EP-0301439
                                                                                                                     EP1033405-A2
                                                                                                                                                         Arabidopsis thaliana
                                                                                                                                                                                                                                                                                 Arabidopsis thaliana protein
                                                                                                                                                                                                                                                                                                                             18-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 130 GDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STEQILDLILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESEL: |:| | ::::|::|:| | | |::::| | | |::::| | | |::::| | | |::::| | | |::::| | | | |::::| | | | |::::| | | | |::::| | | | |::::| | | | |::::| | | |::::| |::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |:::| |::|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              hyfvtryrweeiggdelmvfprvfapkgfhlris 460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HHLVLKENWELAEDDQPFAFPFVDFPNGLPIRVS 510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nlyedplifnpwrwmkkslesq------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFI 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gledvksmkftraviyetsrlativngvlrkttrdleingylipkgwriyvytreinyda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  llrelmgerr------dsge-----tftdmlgylmkkegnrypl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FIERKMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSN----L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----NLMAKHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gsshrlmrgsllslisstmmrdhilpkvdhfmrsyldqwnelevidiqdktkhmaflssl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLV 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      lliivslcsall-----rwnqmrytknglppgtmgwpifgetteflkqgp----nfmr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tqiagnlrkpfv-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     27.1%;
nilarity 32.3%;
Conservative 9:
                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99US-0161405.
99US-0161359.
99US-0161350.
99US-0161361.
99US-0161361.
99US-0161920.
99US-0161992.
99US-0161993.
99US-0161993.
                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Score 726; DB 21;
; Pred. No. 6.6e-56;
91; Mismatches 181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         eefktaffklvvgtlsvpidlpgtnyrcgiqarnnidr
                                                                                                                                                                                                                                                                                                                                                                                                            465
                                                                                                                                                                                                                                                                                   fragment SEQ ID NO: 58495.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -nscfvfgggtrlcpgkelgiveissfl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 462;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10;
                   05-MAR 1999
09-MAR 1999
09-MAR 1999
23-MAR 1999
01-APR 1999
01-APR
              9908-0123848
9908-0123788
9908-0123788
9908-0123788
9908-0123789
9908-0126785
9908-0126785
9908-0128714
9908-0128714
9908-0128714
9908-0128714
9908-0128714
9908-0128714
9908-0128714
9908-0128714
9908-0128714
9908-0128714
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
9908-0128718
```

99US-0143542. 99US-0143624. 99US-0144005.

```
δÃ
                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                             Ş
                                 δÃ
                                                 B
                                                            QY
                                                                           Вb
                                                                                          Q
                                                                                                             Ъ
                                                                                                                       ρ
                                                                                                                                        В
                                                                                                                                                    ΩV
                                                                                                                                                                     ₽
                                                                                                                                                                                                   망
                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 166; Conser
                                                                                                                                                                                                                                                                                         04-OCT-1999
05-OCT-1999
06-OCT-1999
07-OCT-1999
13-OCT-1999
13-OCT-1999
13-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
14-OCT-1999
12-OCT-1999
21-OCT-1999
22-OCT-1999
23-OCT-1999
25-OCT-1999
26-OCT-1999
26-OCT-1999
26-OCT-1999
27-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
        477
                                                                                                             230
                      381
                                                   321
                                                                  357
                                                                                              297
                                                                                                                           241
                                                                                                                                         180
                                                                                                                                                        186
                                                                                                                                                                      120
                                                                                                                                                                                     130
                                                                                                                                                                                                   60
                                                                                                                                                                                                                                11
                                                                                                                                                                                                                                               12
                                                                                                                                                                                                                  70
                                                                                                                                                                                                                              HHLVLKFNWELAEDDQPFAFPFVDFPNGLPIRVS
                     nlyedplifnpwrwmkkslesq-----
                              SRYDQPNLFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFI 476
                                                                                                                    tqiagnlrkpfv-----
                                                                                                                                                                     gsshrlmrgsllslisstmmrdhilpkvdhfmrsyldqwnelevidiqdktkhmaflssl
                                                                                                            llrelmgerr-----dsge-----tftdmlgylmkkegnrypl
                                                                                                                                                                                    GDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTF----
                                                                                                                                        27.18;
nilarity 32.3%;
Conservative 9
                                                                                                                                                                                                                                                                                         990S-0157117.
990S-0157137.
990S-0158029.
990S-0158229.
990S-0159293.
990S-0159293.
990S-015929.
990S-0159331.
990S-0159637.
990S-0159637.
990S-0160741.
990S-0160768.
990S-0160815.
990S-0160815.
990S-0161406.
990S-0161406.
990S-0161359.
990S-0161359.
990S-0161359.
990S-0161359.
990S-0161359.
990S-0161359.
990S-0161359.
990S-0161359.
990S-0161359.
                                                                                                                                                                                                                                                            k; Score 726; DBk; Pred. No. 6.7e91; Mismatches
                 nscfvfgggtrlcpgkelgiveissfl
       510
                                                                                                                                                                                                                                                             DB 21;
5.7e-56;
hes 181;
                                                                                                                                                                                                                                                                           Length 465;
                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                              76;
                                                                                                                                                                                                                                                             Gaps
                                                                                320
                                                                                                             262
                                                                                                                                                       240
                                                                  416
                                                                                                                           296
                                                                                                                                         229
                                                                                                                                                                      179
                                                                                                                                                                                     185
                                                   380
                                                                                              356
                                                                                                                                                                                                                                                              10;
```

13-JUL-1999
15-JUL-1999
16-JUL-1999
16-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
20-JUL-1999
20-JUL-1999
20-JUL-1999
20-JUL-1999
21-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
22-JUL-1999
23-JUL-1999
23-JUL-1999
23-JUL-1999
23-JUL-1999
23-JUL-1999
24-JUL-1999
25-JUL-1999
27-JUL-1999
27-JUL-1999
28-JUL-1999
29-JUL-1999
29-JUL-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
21-AUG-1999
22-AUG-1999
22-AUG-1999
23-AUG-1999
24-SEP-1999
24-SEP-1999
23-SEP-1999

990S-0144086.
990S-014433.
990S-014433.
990S-014433.
990S-014433.
990S-014433.
990S-014433.
990S-0144884.
990S-0145086.
990S-0145085.
990S-0145085.
990S-014591.
990S-014591.
990S-014591.
990S-014591.
990S-014591.
990S-014591.
990S-014591.
990S-014591.
990S-014591.
990S-0147204.
990S-0151066.
990S-0151066.
990S-0151066.
990S-0151069.
990S-0152363.
990S-0152363.
990S-0152363.
990S-0152363.
990S-0152363.
990S-0152363.
990S-0152363.
990S-0152363.
990S-0155486.
990S-0155486.
990S-0155486.
990S-0155486.
990S-0155486.

· * * * * * * * * * * * * * * * * * * *	RES AAG XX
Arabidopsis t Protein ident hybridisation s Arabidopsis t Protein ident hybridisation s Arabidopsis t EP1033405-A2.  06-SEP-2000. 25-FEB-1999 05-MAR 1999 09-MAR 1999 23-MAR 1999 23-MAR 1999 23-MAR 1999 24-MAR 1999 25-MAR 1999 26-APR 1999 27-APR 1999 28-APR 1999 21-APR 1999 23-APR 1999 24-MAY 1999 25-MAY 1999 26-MAY 1999 27-MAY 1999 28-APR 1999 29-APR 1999 21-MAY 1999 21-MAY 1999 21-MAY 1999 21-MAY 1999 21-MAY 1999 21-MAY 1999 21-JUN 1	Db 430 hyfvtry) RESULT 12 AAG11836 D AAG11836 star XX AC AAG11836;
sis thaliana protein fragment SEQ II identification; signal transduction ation assay; genetic mapping; gene ion sequence.  5-A2.  5-A2.  000. 2000EP-0301439.  000. 2000EP-0301439.  999; 99US-0123180. 999; 99US-0125788. 999; 99US-0126785. 999; 99US-0126785. 999; 99US-0130047. 999; 99US-0130047. 999; 99US-01300449. 999; 99US-0132486. 999; 99US-0132487. 999; 99US-0132487. 999; 99US-0132486. 999; 99US-0132487. 999; 99US-0132487. 999; 99US-0134471. 999; 99US-0134471. 999; 99US-013468.	hyfvtryrweeiggdelmvfprvfapkgfhlris 46 2 1836 standard; Protein; 461 AA. 1836;
ID NO: 10708.  on pathway; metabolic pathway; expression control; promoter;	53
18-JUN-1999 21-JUN-1999 22-JUN-1999 23-JUN-1999 24-JUN-1999 29-JUN-1999 20-JUN-1999 20-JUN-1999 20-JUN-1999 20-JUN-1999 20-JUN-1999 20-JUN-1999 20-JUN-1999 20-JUN-1999 20-JUN-1999 21-JUN-1999 21-JUN	8-JUN-199 8-JUN-199 8-JUN-199 8-JUN-199 8-JUN-199 8-JUN-199
99US-0139750 99US-0139763 99US-0139763 99US-0139879 99US-0140895 99US-0140695 99US-014287 99US-014287 99US-014287 99US-014287 99US-014287 99US-014287 99US-0143542 99US-0144354 99US-0144333 99US-0144333 99US-0144333 99US-0144333 99US-0144333 99US-0145086 99US-0147303	905-01 905-01 905-01 905-01 905-01 905-01 905-01

```
Query Match
Best Local
                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18-AUG-
20-AUG-
20-AUG-
20-AUG-
20-AUG-
23-AUG-
23-AUG-
25-AUG-
25-AUG-
27-AUG-
27-AUG
                                                                                                                                                                                                                                                      14-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
21-CCT-1999
22-CCT-1999
22-CCT-1999
22-CCT-1999
22-CCT-1999
25-CCT-1999
25-CCT-1999
25-CCT-1999
26-CCT-1999
26-CCT-1999
26-CCT-1999
26-CCT-1999
27-CCT-1999
28-CCT-1999
28-CCT-1999
29-CCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14-OCT-1999;
14-OCT-1999;
14-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    06-OCT-1999
07-OCT-1999
08-OCT-1999
12-OCT-1999
13-OCT-1999
13-OCT-1999
13-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14-OCT-1999;
   130 GDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMA 189
                                        56
                                                                                                                                  12 LLLLPSLLSLLLFLILLKRRN---RKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDFMQ
                                                                         70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEP-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AUG-1999
                                  nqrlrygs ffk shilg cptivs \verb|mdaelnryilmneskglvagypqsmldilgtcniaavh|
                                                                                                      mmilgllviivclctallrwnqmryskkglppgtmgwpifgetteflkqgp-----dfmk
                                                          QHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVLV 129
                                                                                                                                                                                    164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -1999;
                                                                                                                                                                                                  Similarity
                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                      990S-0151065.
990S-0151080.
990S-0151303.
990S-0151303.
990S-015263.
990S-0153758.
990S-0153758.
990S-0154418.
990S-0154418.
990S-0155428.
990S-0155428.
990S-0155428.
990S-0155428.
990S-015659.
990S-0157753.
990S-0157753.
990S-015829.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99US-0149426.
99US-0149722.
99US-0149723.
99US-0149929.
99US-0149902.
99US-0150566.
99US-0150884.
                                                                                                                                                                                                 26.6%;
                                                                                                                                                                                  93;
                                                                                                                                                                                                 Score 712; DB 21;
Pred. No. 1.1e-54;
                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                 Length 461;
                                                                                                                                                                                Indels
                                                                                                                                                                                Gaps
                                                                                                            55
                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 1
AAG11835
     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
05-MAR 1999
09-MAR 1999
23-MAR 1999
25-MAR 1999
09-MAR 1999
01-APR 1999
01-APR 1999
116-APR 1999
11-APR 1999
21-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
04-MAY 1999
06-MAY 1999
06-MAY 1999
07-MAY 1999
07-MAY 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                 25-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Arabidopsis thaliana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter; termination sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Arabidopsis thaliana protein fragment SEQ ID NO: 10707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  17-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAG11835 standard; Protein; 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    06-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     npwrwmekslesks----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLDNSRYDQPNLF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSN----LSTEQILDLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KHIMSMDPGEEETEQLKKEYVTFMKGVVSAPLNLPGTAYHKALQSRATILKFIERKMEER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 eengedklmvfprvsapkgyhlkcs 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ELAEDDOPFAFPFVDFPNGLPIRVS 510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ftravifetsrlativngvlrktthdlelngylipkgwriyvytreinydtslyedpmif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----esgetft-----dmlgylmkkednrylltdkeirdqv
                                                                                                                                                                                                                                                                                                                                                                                                                                 2000EP-0301439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
990S-0128234

990S-0128714

990S-0129045

990S-0130077

990S-0130510

990S-0130510

990S-0130510

990S-013149

990S-0132048

990S-0132407

990S-0132407

990S-0132485

990S-0132485

990S-0132485

990S-0132486

990S-0132486
                                                                                                                                                                                                                                                                                                                      99US-0121825.
99US-0123180.
99US-0123548.
99US-0125788.
99US-0126264.
                                                                                                                                                                                                                                                                                     99US-0126785
99US-0127462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----yfllfgggvrlcpgkelgisevssflhyfvtkyrw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
```

325 365

425

305

234 249 174

267

Ş

Ş

밁

Ş

밁

000000000000000000000000000000000000000									
Section   Sect	****	* * * * * * *	מתתתתו	* * * * * * * * * * * * * * * * * * *	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	****	*****	**********	, , , , , , , , , , , , , , , , , , ,
Section   Sect	22-Ju 22-Ju 23-Ju 23-Ju	20-JU 20-JU 21-JU 21-JU	19-JI 19-JI 19-JI	12-JU 13-JU 14-JU 15-JU 16-JU	29-10 01-10 01-10 06-10	18-JU 18-JU 21-JU 22-JU 23-JU 23-JU 28-JU	18-JU 18-JU 18-JU 18-JU 18-JU 18-JU	03-JU 04-JU 07-JU 08-JU 110-JU 116-JU 116-JU	14 - M2 14 - M3 14 - M3 11 - M3 11 - M3 11 - M3 20 - M3 21 - M3 21 - M3 22 - M3 27 - M3 27 - M3
100   100	66666	19919	96666	966666	6666666	966666	999999	19919191919	96966666666
100   101	999999							~ · · · · · · · · · · · · · · · · · · ·	
11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3066 3066 3066 3066	3066 3066 3066	30066 30066 30066 30066	3006 30066 30066 30066	20066 20066 20066 20066	3006 3006 3006 3006 3006	00000000000000000000000000000000000000	00000000000000000000000000000000000000	2000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
221. 221. 221. 221. 221. 221. 221. 221.	-014	-014	014	014	-014	-013	- 013 - 013 - 013 - 013 - 013 - 013	-0133	
R 25JUL-1999; 99US-014557 R 27JUL-1999; 99US-014571 R 27JUL-1999; 99US-014571 R 27JUL-1999; 99US-014581 R 27JUL-1999; 99US-014638 R 02AUG-1999; 99US-014638 R 02AUG-1999; 99US-014770 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 06AUG-1999; 99US-014770 R 07AUG-1999; 99US-014770 R 10AUG-1999; 99US-014770 R 11AUG-1999; 99US-014770 R 11AUG-1999; 99US-014817 R 12AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014872 R 27AUG-1999; 99US-014872 R 28EEP-1999; 99US-015130 R 27AUG-1999; 99US-015130 R 27AUG-1999; 99US-015130 R 28EEP-1999; 99US-015130 R 29EEP-1999; 99US-015130 R 21CCT-1999; 99US-015503 R 13CCT-1999; 99US-015503 R 14CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015006 R 21CCT-1999; 99US-016007 R 21CCT-1999; 99US-016007 R 21CCT-1999; 99US-016007	214	0000000		200005472	83018299	35 35 35 35 35 35 35 35	444444444444444444444444444444444444444	4441850750	789 789 789 789 789
R 25JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014638 R 02AUG-1999; 99US-014720 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 10AUG-1999; 99US-014774 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 12AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 20AUG-1999; 99US-014872 R 20AUG-1999; 99US-014872 R 21AUG-1999; 99US-014872 R 22AUG-1999; 99US-014872 R 23AUG-1999; 99US-014872 R 24AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 28SEP-1999; 99US-015508 R 29SEP-1999; 99US-015508 R 21CCT-1999; 99US-015508 R 24SEP-1999; 99US-015508 R 25AUG-1999; 99US-015508 R 26AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 29US-015508									
RR 25JUL-1999; 99US-014557 R 27JUL-1999; 99US-014551 R 27JUL-1999; 99US-014571 R 27JUL-1999; 99US-014638 R 02-AUG-1999; 99US-014638 R 02-AUG-1999; 99US-014770 R 04-AUG-1999; 99US-014770 R 05-AUG-1999; 99US-014770 R 06-AUG-1999; 99US-014770 R 07-AUG-1999; 99US-014770 R 10-AUG-1999; 99US-014770 R 11-AUG-1999; 99US-014770 R 11-AUG-1999; 99US-014770 R 11-AUG-1999; 99US-014877 R 11-AUG-1999; 99US-014877 R 11-AUG-1999; 99US-014877 R 11-AUG-1999; 99US-014877 R 11-AUG-1999; 99US-014877 R 11-AUG-1999; 99US-014877 R 11-AUG-1999; 99US-014972 R 20-AUG-1999; 99US-014972 R 21-AUG-1999; 99US-014972 R 21-AUG-1999; 99US-014972 R 22-AUG-1999; 99US-014972 R 23-AUG-1999; 99US-014972 R 23-AUG-1999; 99US-014972 R 23-AUG-1999; 99US-014972 R 23-AUG-1999; 99US-014972 R 24-SEP-1999; 99US-015106 R 27-AUG-1999; 99US-015106 R 27-AUG-1999; 99US-0151075 R 24-SEP-1999; 99US-0151088 R 24-SEP-1999; 99US-0151088 R 24-SEP-1999; 99US-01510877 R 24-SEP-1999; 99US-015508 R 27-AUG-1999; 99US-015508 R 24-SEP-1999; 99US-015508 R 26-AUG-1999; 99US-015508 R 27-AUG-1999; 99US-015508 R 29US-015508 R 21-CCT-1999; 99US-015508 R 21-CCT-1999; 99US-015607 R 21-CCT-1999; 99US-015607 R 21-CCT-1999; 99US-016007 R 21-CCT-1999; 99US-016007									
R 25JUL-1999; 99US-014557 R 27JUL-1999; 99US-014571 R 27JUL-1999; 99US-014571 R 27JUL-1999; 99US-014581 R 27JUL-1999; 99US-014638 R 02AUG-1999; 99US-014638 R 02AUG-1999; 99US-014770 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 06AUG-1999; 99US-014770 R 07AUG-1999; 99US-014770 R 10AUG-1999; 99US-014770 R 11AUG-1999; 99US-014770 R 11AUG-1999; 99US-014817 R 12AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014817 R 13AUG-1999; 99US-014872 R 27AUG-1999; 99US-014872 R 28EEP-1999; 99US-015130 R 27AUG-1999; 99US-015130 R 27AUG-1999; 99US-015130 R 28EEP-1999; 99US-015130 R 29EEP-1999; 99US-015130 R 21CCT-1999; 99US-015503 R 13CCT-1999; 99US-015503 R 14CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015503 R 21CCT-1999; 99US-015006 R 21CCT-1999; 99US-016007 R 21CCT-1999; 99US-016007 R 21CCT-1999; 99US-016007									
R 25JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014638 R 02AUG-1999; 99US-014720 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 10AUG-1999; 99US-014774 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 12AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 20AUG-1999; 99US-014872 R 20AUG-1999; 99US-014872 R 21AUG-1999; 99US-014872 R 22AUG-1999; 99US-014872 R 23AUG-1999; 99US-014872 R 24AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 28SEP-1999; 99US-015508 R 29SEP-1999; 99US-015508 R 21CCT-1999; 99US-015508 R 24SEP-1999; 99US-015508 R 25AUG-1999; 99US-015508 R 26AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 29US-015508									
R 25UL-1999; 99US-014527 R 27UL-1999; 99US-014527 R 27UL-1999; 99US-014521 R 28UL-1999; 99US-014591 R 28UL-1999; 99US-014591 R 28UL-1999; 99US-014538 R 02AUG-1999; 99US-014638 R 02AUG-1999; 99US-014700 R 04AUG-1999; 99US-014700 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 11AUG-1999; 99US-014774 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-014888 R 11AUG-1999; 99US-015808 R 11									•
R 25JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014638 R 02AUG-1999; 99US-014720 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 10AUG-1999; 99US-014774 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 12AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 20AUG-1999; 99US-014872 R 20AUG-1999; 99US-014872 R 21AUG-1999; 99US-014872 R 22AUG-1999; 99US-014872 R 23AUG-1999; 99US-014872 R 24AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 28SEP-1999; 99US-015508 R 29SEP-1999; 99US-015508 R 21CCT-1999; 99US-015508 R 24SEP-1999; 99US-015508 R 25AUG-1999; 99US-015508 R 26AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 29US-015508									
R 25JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014527 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014528 R 27JUL-1999; 99US-014638 R 02AUG-1999; 99US-014720 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 10AUG-1999; 99US-014774 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 11AUG-1999; 99US-014837 R 12AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 13AUG-1999; 99US-014837 R 20AUG-1999; 99US-014872 R 20AUG-1999; 99US-014872 R 21AUG-1999; 99US-014872 R 22AUG-1999; 99US-014872 R 23AUG-1999; 99US-014872 R 24AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 28SEP-1999; 99US-015508 R 29SEP-1999; 99US-015508 R 21CCT-1999; 99US-015508 R 24SEP-1999; 99US-015508 R 25AUG-1999; 99US-015508 R 26AUG-1999; 99US-015508 R 27AUG-1999; 99US-015508 R 29US-015508									
R 25UL-1999; 99US-014527 R 27UL-1999; 99US-014527 R 27UL-1999; 99US-014521 R 28UL-1999; 99US-014591 R 28UL-1999; 99US-014591 R 28UL-1999; 99US-014538 R 02AUG-1999; 99US-014638 R 02AUG-1999; 99US-014700 R 04AUG-1999; 99US-014700 R 04AUG-1999; 99US-014770 R 05AUG-1999; 99US-014770 R 11AUG-1999; 99US-014774 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-0147481 R 11AUG-1999; 99US-014888 R 11AUG-1999; 99US-015808 R 11									
R 26JUL-1999; 99US-014557 R 27JUL-1999; 99US-014557 R 27JUL-1999; 99US-014591 R 28JUL-1999; 99US-014638 R 02AUG-1999; 99US-014638 R 02AUG-1999; 99US-014730 R 04AUG-1999; 99US-014730 R 04AUG-1999; 99US-014730 R 05AUG-1999; 99US-014730 R 07AUG-1999; 99US-014730 R 08AUG-1999; 99US-014749 R 11AUG-1999; 99US-014749 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0148814 R 11AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 13CCT-1999; 99US-015130 R 22AUG-1999; 99US-015130 R 22AUG-1999; 99US-015130 R 23AUG-1999; 99US-015130 R 24SEP-1999; 99US-015130 R 27AUG-1999; 99US-015130 R 28SEP-1999; 99US-015130 R 29SEP-1999; 99US-015130 R 21CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015903 R 11CCT-1999; 99US-015903 R 11CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076									
R 26JUL-1999; 99US-014557 R 27JUL-1999; 99US-014557 R 27JUL-1999; 99US-014591 R 28JUL-1999; 99US-014638 R 02AUG-1999; 99US-014638 R 02AUG-1999; 99US-014730 R 04AUG-1999; 99US-014730 R 04AUG-1999; 99US-014730 R 05AUG-1999; 99US-014730 R 07AUG-1999; 99US-014730 R 08AUG-1999; 99US-014749 R 11AUG-1999; 99US-014749 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0148814 R 11AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 13CCT-1999; 99US-015130 R 22AUG-1999; 99US-015130 R 22AUG-1999; 99US-015130 R 23AUG-1999; 99US-015130 R 24SEP-1999; 99US-015130 R 27AUG-1999; 99US-015130 R 28SEP-1999; 99US-015130 R 29SEP-1999; 99US-015130 R 21CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015903 R 11CCT-1999; 99US-015903 R 11CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076									
R 26.JUL-1999; 99US-0145571 R 27.JUL-1999; 99US-0145571 R 27.JUL-1999; 99US-0145571 R 27.JUL-1999; 99US-014551 R 28.JUL-1999; 99US-014538 R 02.AUG-1999; 99US-014638 R 02.AUG-1999; 99US-014638 R 02.AUG-1999; 99US-014730 R 04.AUG-1999; 99US-014730 R 04.AUG-1999; 99US-014730 R 05.AUG-1999; 99US-014730 R 07.AUG-1999; 99US-014730 R 08.AUG-1999; 99US-014730 R 11.AUG-1999; 99US-014749 R 11.AUG-1999; 99US-014749 R 11.AUG-1999; 99US-014749 R 11.AUG-1999; 99US-014814 R 11.AUG-1999; 99US-014814 R 11.AUG-1999; 99US-014868 R 11.AUG-1999; 99US-015808 R 11.AUG-1999; 99U									
R 26JUL-1999; 99US-014557 R 27JUL-1999; 99US-014557 R 27JUL-1999; 99US-014591 R 28JUL-1999; 99US-014638 R 02AUG-1999; 99US-014638 R 02AUG-1999; 99US-014730 R 04AUG-1999; 99US-014730 R 04AUG-1999; 99US-014730 R 05AUG-1999; 99US-014730 R 07AUG-1999; 99US-014730 R 08AUG-1999; 99US-014749 R 11AUG-1999; 99US-014749 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0147449 R 11AUG-1999; 99US-0148814 R 11AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 12AUG-1999; 99US-0148912 R 13CCT-1999; 99US-015130 R 22AUG-1999; 99US-015130 R 22AUG-1999; 99US-015130 R 23AUG-1999; 99US-015130 R 24SEP-1999; 99US-015130 R 27AUG-1999; 99US-015130 R 28SEP-1999; 99US-015130 R 29SEP-1999; 99US-015130 R 21CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015803 R 11CCT-1999; 99US-015903 R 11CCT-1999; 99US-015903 R 11CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-015903 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076 R 21CCT-1999; 99US-0160076									
R 26.JUL-1999; 99US-0145571 R 27.JUL-1999; 99US-0145571 R 27.JUL-1999; 99US-0145571 R 27.JUL-1999; 99US-014551 R 28.JUL-1999; 99US-014538 R 02.AUG-1999; 99US-014638 R 02.AUG-1999; 99US-014638 R 02.AUG-1999; 99US-014730 R 04.AUG-1999; 99US-014730 R 04.AUG-1999; 99US-014730 R 05.AUG-1999; 99US-014730 R 07.AUG-1999; 99US-014730 R 08.AUG-1999; 99US-014730 R 11.AUG-1999; 99US-014749 R 11.AUG-1999; 99US-014749 R 11.AUG-1999; 99US-014749 R 11.AUG-1999; 99US-014814 R 11.AUG-1999; 99US-014814 R 11.AUG-1999; 99US-014868 R 11.AUG-1999; 99US-015808 R 11.AUG-1999; 99U									
7-JUL-1999; 99US-014527 7-JUL-1999; 99US-014521 7-JUL-1999; 99US-014521 7-JUL-1999; 99US-014521 7-JUL-1999; 99US-014521 8-JUL-1999; 99US-014638 7-AUG-1999; 99US-014638 7-AUG-1999; 99US-01470 7-AUG-1999; 99US-01470 7-AUG-1999; 99US-01471 7-AUG-1999; 99US-01471 7-AUG-1999; 99US-01471 7-AUG-1999; 99US-01471 7-AUG-1999; 99US-014817 7-AUG-1999; 99US-014917 7-AUG-1999; 99US-014817 7-AUG-1999; 99US-014817 7-AUG-1999; 99US-014817 7-AUG-1999; 99US-015086 7-AUG-1999; 99US-015081 7-AUG-1999; 99US-016081 7-AUG-1999; 99US-016081 7-AUG-1999; 99US-016081 7-AUG-1999; 99US-016081 7-	ק קק קק קק קק	יי א קיים א א א א א	PR PR	קי קי קי קי קי קי קי קי קי קי קי קי קי ק	קי קי קי קי קי קי קי	Р Р Р Р Р Р Р Р Р Р Р Р Р Р Р Р Р Р Р	P	קק קק קק קק קק קק קק קק קק קק	אַ מָ
JUL-1999 JUL-1999 JUL-1999 JUL-1999 JUL-1999 JUL-1999 JUS-014521 JUL-1999 JUS-014591 JUL-1999 JUS-014591 JUL-1999 JUS-014638 AUG-1999 JUS-014638 AUG-1999 JUS-01470 AUG-1999 AUG-1999 AUG-1999 JUS-01471 AUG-1999 JUS-01471 AUG-1999 JUS-01472 AUG-1999 JUS-01473 AUG-1999 JUS-01473 AUG-1999 JUS-01473 AUG-1999 JUS-01474 AUG-1999 JUS-01477 AU	221111		. 4 4 4 4 4	, oo -1 oo u + - eo e	+ m v o u u m c	27440777	ψ. γ. γ. γ. φ. φ. φ. φ. φ. γ. φ.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	4 + 4 W W W W W W J J J O W
99999999999999999999999999999999999999		аннин	нанын	OCCI OCCI OCCI OCCI OCCI OCCI OCCI OCCI	SEP SEP SEP	AUG AUG AUG AUG AUG SEP SEP	AUG AUG AUG AUG AUG AUG AUG	AUG AUG AUG AUG AUG AUG AUG	
99US-014527 99US-014527 99US-014527 99US-014527 99US-014638 99US-014638 99US-014770 99US-014770 99US-014770 99US-014770 99US-014770 99US-014770 99US-014770 99US-014770 99US-014780 99US-014834 99US-014834 99US-014834 99US-014834 99US-014834 99US-014834 99US-014834 99US-014834 99US-0155088	000000000000000000000000000000000000000	666 666 666 666 666	666666666666666666666666666666666666666	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66666666666666666666666666666666666666	66666666666666666666666666666666666666	00000000000000000000000000000000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
905 014521 905 014591 905 014591 905 014591 905 014591 905 014638 905 014638 905 014730 905 014730 905 014749 905 014749 905 014749 905 014749 905 014749 905 014814 905 014814 905 014814 905 014814 905 015110 905 01510	10 10 10 10 10 10 1	0.10.10.10.10.10		0.10.10.10.10.10.10.10	10 10 10 10 10 10 10 10	0 10 10 10 10 10 10 10			
∪ U U U U U U U U U U V V V V V V V V V	206 206 206 206 206	806 806 806 806	806 806 806 806 806	SD6	SD6	806 806 806 806 806 806	. 506 . 506 . 506 . 506 . 506 . 506 . 506	\$000 \$000 \$000 \$000 \$000 \$000 \$000 \$00	800 800 800 800 800 800 800 800 800 800
// H	01607 01607 01608 01608 01608 01609	01596 01596 01595 01595 01607	01592 01592 01593	01564 01565 01571 01577 01578 01580 01582	01537 01540 01540 01547 01551 01551	01510 01510 01510 01513 01514 01519	01493 01491 01494 01497 01497 01499 01499 01505	01473 01473 01474 01474 01479 01483 01483 01483	01452 01452 01459 01459 01459 01463 01463 01470 01473
	881176	<i>υ</i> ω ω <b>4</b> π		7 W C G G C W C	5837315	1000000	86W0NNN76	8641739106	0003888511172

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B. 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PR
PR
PR
PR
PR
PR
PR
                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 26.6%;
Best Local Similarity 32.5%;
Matches 164; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22-CCT-1999
25-CCT-1999
25-CCT-1999
25-CCT-1999
26-CCT-1999
26-CCT-1999
26-CCT-1999
28-CCT-1999
28-CCT-1999
28-CCT-1999
29-CCT-1999
                                                                                                                                              17-OCT-2000
                                                                                                                                                                   AAG11834;
                                                                                                                                                                                         AAG11834 standard;
             06-SEP-2000
                                                                                    Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                       Arabidopsis
                                  EP1033405-A2
                                                       Arabidopsis thaliana
                                                                             termination
                                                                                                                                                                                                                                                436
                                                                                                                                                                                                                                                                                                                                                                                 269
                                                                                                                                                                                                                                                                                                                                                                                                      306
                                                                                                                                                                                                                                                                                                                                                                                                                              236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         130
                                                                                                                                                                                                                                                                                          387
                                                                                                                                                                                                                                                                                                                                       327
                                                                                                                                                                                                                                                                                                                                                           366
                                                                                                                                                                                                              14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSN----LSTEQILDLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \tt gpshrlmrgsllslisptmmkdhllpkiddfmrnylcgwddletvdiqektkhmaf-lss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ELAEDDQPFAFPFVDFPNGLPIRVS 510
                                                                                                                                                                                                                                                                                                                                                                       LSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKKMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNLMA
                                                                                                                                                                                                                                            eengedklmvfprvsapkgyhlkcs 460
                                                                                                                                                                                                                                                                                                                                                                                                                           k------esgetft------dmlgylmkkednrylltdkeirdqv
                                                                             sequence
                                                                                                                      thaliana protein fragment SEQ ID NO: 10706.
                                                                                                                                            (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               990S-0160989.
990S-0161404.
990S-0161406.
990S-0161369.
990S-0161361.
990S-0161361.
990S-0161920.
990S-0161993.
990S-0161993.
990S-0161993.
                                                                                                                                                                                         Protein;
                                                                                                                                            entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     93;
                                                                                                                                                                                         465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 712; DB 21;
Pred. No. 1.1e-54;
3; Mismatches 196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 462;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                               485
                                                                                                                                                                                                                                                                                                                                                          425
                                                                                                                                                                                                                                                                                                                                                                                                                                                 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         56
                                                                                                                                                                                                                                                                                            435
                                                                                                                                                                                                                                                                                                                                     386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
  05-MAR 1999
09-MAR 1999
09-MAR 1999
23-MAR 1999
23-MAR 1999
23-MAR 1999
06-APR 1999
06-APR 1999
08-APR 1999
08-APR 1999
08-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
24-APR 1999
06-MAY 1999
07-MAY 1999
11-MAY 1999
11-JUN 1999
11-JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           25-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2000EP-0301439
990S-0126264
990S-012762
990S-012834
990S-012891
990S-013049
990S-0130486
990S-0132487
990S-0132486
990S-0132486
990S-0132486
990S-0132486
990S-0132486
990S-0134219
990S-0134221
990S-0139452
990S-0139452
990S-0139452
990S-0139453
990S-0140823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99US-0121825.
99US-0123180.
99US-0123548.
99US-0125788.
```

)-JUL-1999;

)-JUL-1999; )-JUL-1999;

```
Ş
                                                                    Qy
                                                                                               В
                                                                                                                    Qy
                                                                                                                                                                  80
                                                                                                                                                                                           망
                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 163
                                                                                                                                                                                                                                                                                                                                                                                                                            28-SEP 1999
29-SEP 1999
04-OCT 1999
06-OCT 1999
07-OCT 1999
   388
                          424
                                                  328
                                                                        364
                                                                                               270
                                                                                                                      304
                                                                                                                                             237
                                                                                                                                                                  248
                                                                                                                                                                                            177
                                                                                                                                                                                                                 188
                                                                                                                                                                                                                                        118
                                                                                                                                                                                                                                                               128
                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                          14 LLPSLLSLLLFLILL-----KRRNRKTRFNLPPGKSGWPFLGETIGYLKPYTATTLGDF
                                                                                                                                                                                                                                                                                                                                    w
                                              LILSLLFAGHETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELGESELNWDDYKK
                                                                                                                                                                                                                                      ifnpwrwmekslesks--
                                                                                              qvvtilysgyetvsttsmmalkylhdhpkaleelrrehlairerkrp--depltlddiks
                                                                                                                                                        ERKLDIKEEDQEEEEEVKTEDEAEMSKSDHVRKQRTDDDLLLGWVLKHSN----LSTEQILD
                                                                                                                                                                                          ssllqiaetlkkpeveeyrteffklvvgtlsvpidipgtnyrsgvqarnnidrlltelmq
                                                                                                                                                                                                       LFNPWRWQQQNNGASSSGSGSFSTWGNNYMPFGGGPRLCAGSELAKLEMAVFIHHLVLKF
                                                                                                                                           erk-----dmlgylmkkednrylltdkeird
                                                                                                                                                                                                                                                                                                  MQQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLV
                                                                                                                                                                                                                                                                                                                                                                                tch 26.6%;
al Similarity 32.1%;
163; Conservative 9
                                                                                                                                                                                                                                                                                                                                                                                                                            990S-0156468
990S-0156468
990S-015717
990S-0157853
990S-0158236
990S-0158236
990S-0159293
990S-0159293
990S-0159331
990S-0159331
990S-0159331
990S-0159637
990S-0160741
990S-0160770
990S-0160770
990S-0160815
990S-0161406
990S-0161406
990S-0161406
990S-0161359
                                                                                                                                                                                                                                                                                                                                                                                ; Score 712; DB 21;
; Pred. No. 1.2e-54;
94; Mismatches 194;
--yfllfgggvrlcpgkelgisevssflhyfvtky
                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                 56;
                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                         483
                                                                        423
                                                                                                                      363
                                                                                                                                                                                                                                        176
                                                                                                                                                                                                                                                                                     117
                                                                                                                                                                                                                                                                                                                                    57
   436
                                                                                               327
                                                                                                                                                                  303
                                                                                                                                                                                          236
                                                                                                                                                                                                                 247
                                                                                                                                                                                                                                                               187
                                                                                                                                                                                                                                                                                                                                                          67
                                                387
                                                                                                                                             269
                                                                                                                                                                                                                                                                                                                                                                                8,
```

99US-0142920 99US-01443624 99US-01444085 99US-01444331 99US-0144332 99US-0144333 99US-0144333 99US-0144333 99US-0144333 99US-0144333 99US-0144333 99US-0145088 99US-0145088 99US-0145088 99US-0145087 99US-0145087 99US-0145088 99US-0145218 99US-0145216 99US-0145216 99US-0145216 99US-0145216 99US-0145216 99US-0146389 99US-014720 99US-014831 99US-014972 99US-014972 99US-014972 99US-014972 99US-014972 99US-014972 99US-014972 99US-014972 99US-0151088 99US-0151088

19-JUL-1999
19-JUL-1999
19-JUL-1999
19-JUL-1999
20-JUL-1999
20-JUL-1999
21-JUL-1999
22-JUL-1999
22-JUL-1999
23-JUL-1999
23-JUL-1999
23-JUL-1999
23-JUL-1999
23-JUL-1999
24-JUL-1999
25-JUL-1999
26-JUL-1999
27-JUL-1999
27-JUL-1999
28-JUL-1999
29-JUL-1999
29-JUL-1999
20-AUG-1999
20-AUG-1999
21-AUG-1999

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
 25-FEB-1999
05-MAR 1999
09-MAR 1999
23-MAR 1999
25-MAR 1999
26-MAR 1999
06-APR 1999
06-APR 1999
07-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
23-APR 1999
24-MAY 1999
05-MAY 1999
06-MAY 1999
07-MAY 1999
11-MAY 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter; termination sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAG20783 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    06-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EP1033405-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Arabidopsis thaliana protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  17-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Arabidopsis thaliana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         484 NWELAEDDQPFAFPFVDFPNGLPIRVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   rweengedklmvfprvsapkgyhlkcs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2000EP-0301439
99US-0121825
99US-012548
99US-0125788
99US-0126785
99US-0126785
99US-0128714
99US-0128714
99US-0128714
99US-0130479
99US-013047
99US-0133484
99US-013484
99US-013484
99US-013487
99US-0134768
99US-0135353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Protein; 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23102
  18-JUN-1999
22-JUN-1999
23-JUN-1999
23-JUN-1999
24-JUN-1999
24-JUN-1999
25-JUN-1999
26-JUN-1999
27-JUN-1999
27-JUN-1999
27-JUN-1999
27-JUN-1999
27-JUN-1999
27-JUN-1999
27-JUN-1999
27-JUN-1999
28-JUN-1999
28-JUN-1999
29-JUN-1999
20-JUN-1999
20-JUN-1999
20-JUN-1999
20-JUN-1999
21-JUN-1999
22-JUN-1999
23-JUN-1999
23-JUN-1999
24-JUN-1999
25-JUN-1999
26-JUN-1999
27-JUN-1999
27-JUN-1999
28-JUN-1999
29-JUN-1999
20-JUN-1999
20-JUN-1999
20-JUN-1999
21-JUN-1999
21-JUN
9908-0139454.
9908-0139455.
9908-0139456.
9908-0139460.
9908-0139463.
9908-0139463.
9908-0139463.
9908-0139563.
9908-0140354.
9908-0140354.
9908-0140354.
9908-0140354.
9908-0140354.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014203.
9908-014433.
9908-014433.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
9908-014521.
```

```
Ş
밁
                                   밁
                                                 Š
                                                                   Query Match 24.4%;
Best Local Similarity 30.7%;
Matches 160; Conservative 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16-AUG-1999
17-AUG-1999
18-AUG-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
23-AUG-1999
23-AUG-1999
25-AUG-1999
26-AUG-1999
27-AUG-1999
60 tskqkrygeifktrilgypcvmlaspeaarfvlvthahmfkptyprskekligpsalffh 119
                  69
                                                   9
                                QQHVSKYGKIYRSNLFGEPTIVSADAGLNRFILQNEGRLFECSYPRSIGGILGKWSMLVL 128 :||:|::|| ::| ::
                                                                                                     9908-014936

9908-014972

9908-014992

9908-014992

9908-014992

9908-0151066

9908-0151066

9908-015106

9908-015106

9908-015133

9908-015133

9908-015263

9908-0153070

9908-0153070

9908-015555

9908-015555

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-015655

9908-0166741

9908-016098

9908-0161406

9908-0161406

9908-0161406

9908-0161406

9908-0161406

9908-016135

9908-0161406

9908-0161361

9908-0161361

9908-0161361

9908-0161361

9908-0161361

9908-0161361

9908-0161361

9908-0161361

9908-0161361

9908-0161361
                                                                   ; Score 653.5; DB 21;
; Pred. No. 1.8e-49;
91; Mismatches 189;
                                                                   Indels
                                                                                    Length 468;
                                                                   81;
                                                                   Gaps
                                                                    13;
```

```
В
                                                       20
                                                                             Вb
                                                                                           δõ
                                                                                                                 밁
                                                                                                                                   οy
                                                                                                                                                                        Qy
                                                                                                                                                       В
                                                                                                                                                                                              밁
                                                                                                                                                                                                              οy
                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                 188
                                      382
                                                                             322
                                                                                              356
                                                                                                                 267
                                                                                                                                    300
                                                                                                                                                                                              179
                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                    129 VGDMHRDMRSISLNFLSHARLRTILLKDVERHTLFVLDSWQQNSIFSAQDEAKKFTFNL-
                                                                                                                                                        234
                                                                                                                                                                          245
                                                                                                               LNWDDYKKMDFTQCVINETLRLGNVVRFLHRKALKDVRYKGYDIPSGWKVLPVISAVHLD
                                                                                                                                                        iicerr----
lhhlvsnfrwevkggekgiqyspfpip----qng:lpatfrr 465
                                                                                                                                                                  KMEERKLDIKEEDQEEEEVKTEDEAEMSKSDHVRKQRTDDDLLGWVLKHSN-----LSTE
: ||: | | | | | | | | | |
                                                                                                                                                                                          qgdyhshirklvqssfypetirk-lipdiehialsslqswanmpivstyqemkkfafdvg
           IHHLVLKFNWELAEDDQ-----PFAFPFVDFPNGLPIRVSR 511
                                                                          {\tt ltwrqtrnmplthkviveslrmasiisftfreavvdveykgylipkgwkvmplfrnihhn}
                                  ----vnpkpntfmpfgsgvhacpgnelaklqilif
                                                                                                                                                     -----ekralqtdflghllnfknekgrvltqe
                                                                                             415
                                                          475
                                      428
                                                                          381
                                                                                                                321
                                                                                                                                    355
                                                                                                                                                      266
                                                                                                                                                                         299
                                                                                                                                                                                            233
                                                                                                                                                                                                               244
                                                                                                                                                                                                                                  178
                                                                                                                                                                                                                                                     187
```

Search completed: September 28, 2001, 18:44:18 Job time: 48 sec